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Contributions.

Comforts for Workmen.

OCTOBER 31, 1889.

TO THE EDITOR OF THE RAILROAD GAZETTE.

I am interested in a company that expects to employ a large number of men, and is desirous of doing something for their benefit in the shape of putting up for them a building to contain library, gymnasium, billiard tables, etc. Believing that ventures of this kind have not been numerous in this country, and where attempted have not been universally successful, the company I refer to is desirous of learning where any such institutions exist and the rules and methods under which they are operated, being anxious to benefit by the experience and avoid the mistakes, if any, of others who have worked on these lines.

I write, therefore, to request you, if agreeable, to give this letter prominence in your columns, in the hope and with the request that any of your readers who are able to do so, will send me, in your care, such printed or other information as they can bearing on this subject.

MANUFACTURER.

Signaling on the Pennsylvania Company's System.

BUFFALO, N. Y., Oct. 29, 1889.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read your note of Oct. 25 on the principles of signaling as applied on the Pennsylvania Company's lines. I have since got hold of a copy of the pamphlet referred to, and have been much interested in the details there elaborated. While, as you say, the principles of the science have been justly appreciated, there are still a number of points which strike one as novel, and which, it seems to me, are worthy of careful attention. With no spirit of criticism, but with a desire to inform myself and to have clearly set forth the differences from the practice of other roads and the innovations on what has been regarded as well-established practice in England as well as in this country, I jot down a few queries. However intense our Americanism, we must acknowledge that England is the mother of block and interlocking signals, and that it is an exceedingly sharp and wise American who has no need to learn at her feet.

The first thing that strikes the casual reader is the somewhat original use of terms, an "auxiliary home signal" and a "starting home signal" being something that at first sight the reader familiar with existing literature on this subject does not understand. I suppose the author of this pamphlet desires to convey the idea that a starting signal is positive and not cautionary, but why he should use the word "home" in connection with it does not appear. If he wishes to improve on the time-honored fashion of simply calling it a starting signal, why not say "positive starting" signal? An auxiliary signal must be one which assists another or is subsidiary to it. This may properly apply to a caution signal, but the starting signal cannot be regarded in any such light. It is as positive in its place as the home signal, and is wholly independent of that.

In Rule 6 the Pennsylvania Company has definitely adopted the principle of having but two arms on a post, and the top arm must always govern the high-speed route. In this the former well-known standard by which the upper arm should always indicate for the track furthest to the right (the remaining arms being placed in the order of their respective tracks, proceeding to the left) has been departed from. Is there any good reason for this? Multiplication of standards always has its disadvantages, and is unwarrantable except for strong reasons.

The rule concerning distant signals seems to require that they be located within sight of the signalman, but I am inclined to think that the writer meant to say that they should be so placed whenever practicable. The latitude allowed in selecting the location seems rather wide. Engineers who in most cases have 2,000 ft. in

which to stop are liable to be off their guard when encountering a signal which gives them only 1,000 ft. of room, and thus get into trouble. As such signals are always at places where engineers have at least some idea of their location, an inflexible distance would seem to be not impracticable. The requirement that the distant signals must always stand 600 ft. short of the home signal at the next cabin must sometimes impair its efficiency, if not produce positive inconsistency in the regulations. It is required that no signal be located between a signal and its distant signal. This, I suppose, does not preclude the placing of two or more home signals in a yard, both of which shall be interlocked with one distant signal; but the phraseology of the rule leaves one in doubt on the point. The starting signal is called a home signal in these rules, and, furthermore, there certainly must be instances on the Pennsylvania as well as on other roads where a side track or cross-over needs to be protected by a home signal close to a grade crossing or a drawbridge which must also be protected by a home signal. One signal cannot be made to answer for both danger points, and yet they are near enough together to both be placed under the protection of a single distant signal.

I note that in the diagrams shown in this book, which, I suppose, indicate the standard practice of the road, many or all of the switches are provided with signals for movement only in one direction. Are we to understand that the Pennsylvania does not provide signals for "backing up" movements? P. S. E.

Narrow-Gauge Railroads in Iowa.

NEWTON, Ia., Nov. 4, 1889.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Of the whole railroad mileage of Iowa, amounting to 8,230 miles in 1888, 21 roads with a mileage of 2,702 miles, or about 33 per cent. of the whole, did not, during that year, pay operating expenses, taxes and interest. Of the whole 41 roads, seven, with mileage of 431 miles, or 5.2 per cent., did not pay operating expenses. Of standard-gauge mileage 20½ per cent. did not pay operating expenses, taxes and interest. Of the whole narrow-gauge mileage none paid operating expenses, and probably none of the existing narrow-gauge roads have ever paid operating expenses, taxes and interest. It is hardly an unfair presumption that those that were worth it and were able to do so changed to standard gauge. The Commissioners' schedule may do them a service in affording an excuse for "shutting up shop."

It does not follow, however, that because none of the narrow-gauge lines pay expenses, if standard-gauge lines had been substituted in the same territory, the conditions would have been different, although I believe that at least one of them may be made to pay after it is changed to standard gauge.

It is doubtless true that narrow-gauge roads were built when no others would have been projected, on account of the popular fallacy prevailing 12 or 15 years ago, that the expense of construction and operation of railroads was directly proportional to width of gauge. The adventurer, or professional subsidy hunter, worked upon this weakness to the fullest extent, and successfully inaugurated projects that would not otherwise have been entertained. The writer remembers when the first narrow gauge project was started in Iowa. Parties who had become possessed of subsidies that had been voted for a standard-gauge road, the construction of which had been postponed indefinitely, were anxious to realize on their investment before being debarred by legal limitations. Nothing would enable them to do so except the construction of a railroad. The advice of the writer was asked as to the merits and economy of the narrow gauge. It was given with emphasis, unfavorable to roads of that kind. It did not accord with the opinion of those asking it. They had the "courage of their convictions," only their convictions were not well grounded. They built between 30 and 40 miles of railroad, and naturally employed an engineer to take charge of it who was in sympathy with them.

Fully believing that public opinion was going astray, the writer undertook to correct it through the press. Doubtless it will be a surprise, even to the editor himself, of a prominent newspaper, to be reminded that the article presented to it was rejected on the ground that the paper did not propose to antagonize any public enterprise. Everybody was wise on this subject. A judge was enthusiastically in favor of "such lines as the trunk lines would not gobble up." The more uncertain the connection, and the more difficult the transfer, the greater number of communities supported by a given amount of traffic! A whilom preacher, who sometimes edited a newspaper, did not scruple to tell the civil engineer that he had lived for a poor purpose if his twenty or more years' experience had not suggested to him what would best satisfy the transportation needs of the future.

Confessing some surprise that there is still more than 100 miles in a single line of narrow-gauge railroad in Iowa, the writer still hopes to live long enough to see all such lines above ground in Iowa have sufficient financial ability to make the change to "standard." He is hardly surprised, however, that even the newspaper that had such unbounded faith in the "narrow gauge as the retail railroad of the future" should hail with delight the broadening of the gauge of about 30 miles of railroad as "practically the bringing of another railroad into Des Moines." A.

Foreign Shop Notes.

The shops of the Northern railroad of France, located in the city of Paris at 78 Rue de Poissonnieres, are well fitted with tools, many of which, however, are old, but still capable of doing good work. Several novelties are to be seen there, among which are two drop tables for removing driving wheels. One is operated by hand with plain screw jacks, and the other by a special form of jack, which is power driven. The capacity of these drop tables is two engines each at one time. Thus one pair of drivers can be removed from each of four different locomotives at the same time. At this point there is a large locomotive engine house of rectangular form having a broken stone floor. It is well lighted, and is supplied with a steam transfer table, and an extra table which is hauled about by the steam transfer. This is a new engine house, and one of the best to be seen in France.

Several of the locomotives in use on this road have been fitted with the radial axle box, but they do not give satisfaction, and, therefore, the radial truck is being removed and a four-wheel bogie substituted in its stead.

At this shop drawings are reproduced by a direct process, which gives a black line on a white ground. The photograph, when finished, is exceedingly plain, and the system is a success.

The boilers are hydraulic riveted, and the calking is done both on the inside and on the outside. Tires are heated both by gas and by coal in different parts of the shop. The engines are fitted with a sand blast in front of the forward drivers.

It was at this shop that the three compound locomotives and other interesting locomotives exhibited at the Exposition were built. Considerable work is in contemplation at the present time. Forty of the freight locomotives are to be changed into compounds of the Woolfe type. This type of engine was described in the *Railroad Gazette*, March 8, 1889. The shop seems to be operated upon an excellent system, and after inspection of the outfit one is no longer surprised at the fine exhibit which this company made at the Paris Exposition.

The shops of the Northeastern Railway at Gateshead, near Newcastle, England, have seen many changes in plans and organization, and the records of such changes are observable in the buildings. One of the marked peculiarities is the remains of an old plan of placing the forges and blacksmith work in a sort of sub-cellar, above which, carried by immense stone arches, are the floors of the heavy machine shops. It is needless to say that this plan had to be abandoned after several ineffectual attempts to make it a success, but the sub-cellars remain as curiosities, and are used as store-houses and for some classes of light work.

Those shops are the home of the Worsdell compound, and it is here that Mr. Worsdell has built all of the compound engines now in use on the Northeastern Railway. A new large compound locomotive has just been constructed carrying 200 lbs. pressure in the boiler. The boiler is made of ¾ steel and is 4 ft. 3 in. in diameter. The locomotive has novelties in the truck, which is both radial and swivel, and the steam chest is located outside of the frames. The driving wheels are of cast steel, 7½ in. outside diameter. The steel castings of the driving wheels are procured from Germany at a price of about 20 shillings per hundred weight, equal to about 4½ cents per lb. The cab resembles the American cab, but is built of iron. The cross head end of the main rod is made solid without adjustment. The locomotive is furnished with a brick arch and the air pump is placed in the cab. The tender used with this locomotive carries 3,200 gallons, and in a run from Newcastle to Edinburgh, 124½ miles without stop, 2,900 gallons of water are used, the coal burned being about 25 lbs. per mile.

The shop has a capacity of about 60 engines each six months. Mr. Worsdell has introduced steel in the place of iron for the slab frames with much success. The metal is smoother, and does not require grinding, as is the case with iron not smoothly rolled. At these shops metal saws are used to a large extent, and milling machines are at work which are guided by taper formers. The erecting shops have a capacity of 35 locomotives. Smoke-box tube plates are pressed to shape by hydraulic presses carrying 400 tons pressure. The crown bars are made of cast steel at a cost of 21 shillings per hundred weight. The boilers are made with butt joints, both for the round-about and horizontal seams. The use of a butt joint for the round-about seams is new, and the welt is placed only on the outside; that is, the two adjoining courses are made of the same external diameter, and a wide welt ring connects the two. This allows the boiler to be smooth on the inside and the same diameter from the front to the gusset sheet. The fast locomotives are supplied with the Gresham & Craven sanding device. These shops, like many other English shops, are cramped for room, and all available space is occupied.

Vestibules are being placed upon first-class cars in Europe, but as a rule they are differently located from those in use in America, a larger portion of the platform being included in the vestibule. In the United States the universal custom is to include only enough of the platform to make a good longitudinal passage, but in Europe many of the vestibules extend the full width of the car

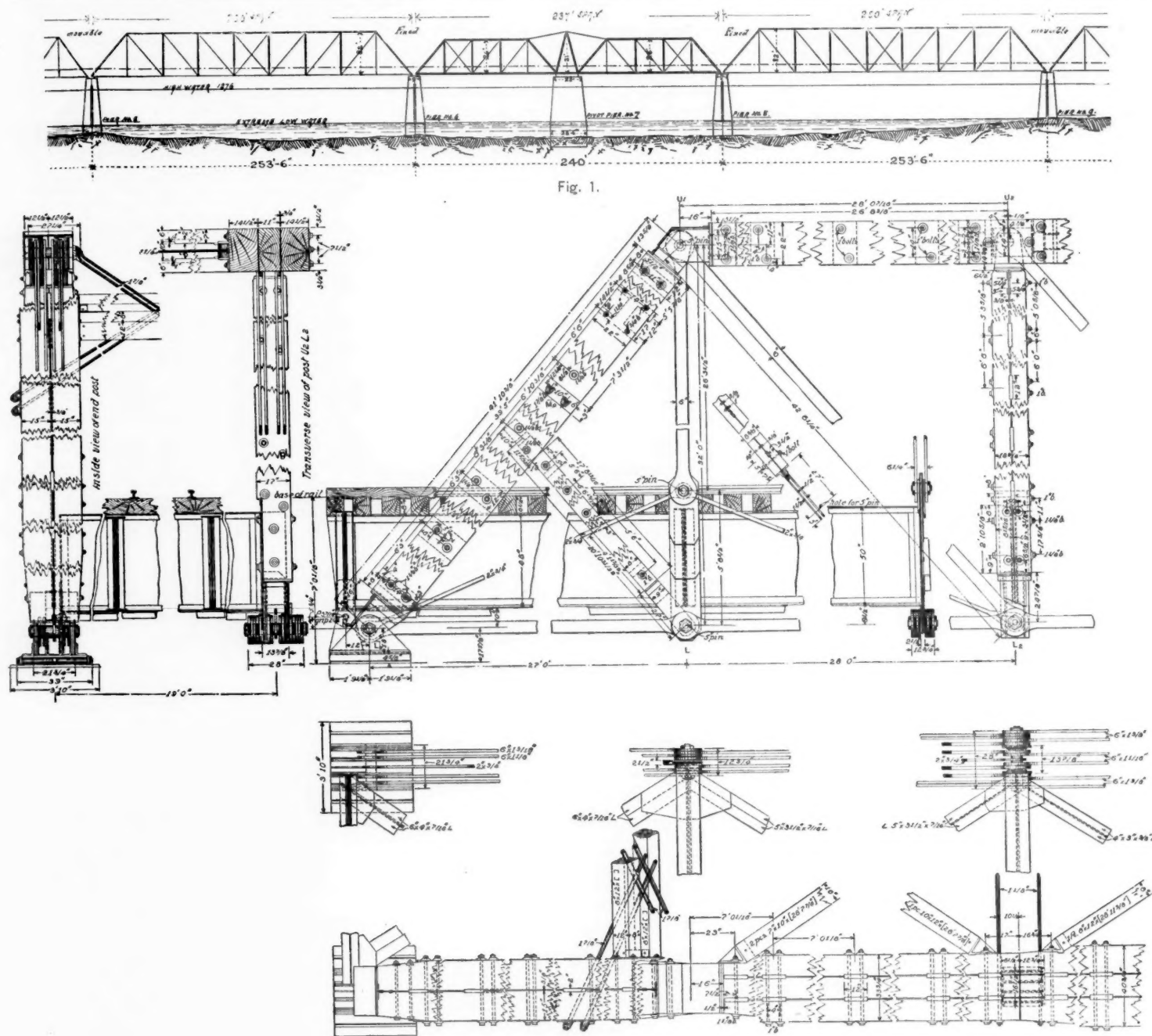


Fig. 2.

KENNEWICK BRIDGE—NORTHERN PACIFIC RAILROAD.

MR. L. L. BUCK, M. Am. Soc. C. E., Engineer.

and inclose the whole platform. Both types have their advantages. The one in use in the United States is more easily repaired and costs less to construct. That used in Europe gives a wider passage between cars and more room for opening the doors.

Kennewick Bridge, Northern Pacific Railroad.

In 1884 the Cascade Division of the Northern Pacific Railroad was in process of construction, and required a considerable number of bridges at various points, some of which were to have pretty long spans. The question as to the character of bridges which it was best to construct for this division was an important one. For a large part of its length the line passes through a country densely covered with timber, of which the greater part is a species of fir. Much of this fir grows to an immense size and height, is straight grained, and, compared to most other timber, is free from knots. It is very strong and yet, when seasoned, very light. It is, therefore, especially adapted to be used in forming the compression members of combination bridges. Moreover, the distance of the division in question from any considerable iron bridge manufactory is so great as to largely increase the cost of iron bridges.

Gen. Adna Anderson, who was at that time Chief Engineer of the Northern Pacific, after a careful investigation of the question, decided to construct a considerable number of combination bridges. Two that were built were of 300 ft. span. They have given very good satisfaction.

In the fall of 1886, when the Cascade Division was approaching completion, its only means of crossing the Columbia River where it joins the Idaho Division was by a small transfer steamer, with a capacity for eight freight cars at a trip. The transfer was located about three miles above the mouth of the Snake River.

The Columbia at this point has at high water a width of half a mile, at which time the current in the middle has a

velocity of seven miles per hour. At low water the width of the waterway is about 900 ft. less. The depth at low water is from 6 to 17 ft. The difference in depth between high and low water is about 28 ft. The bottom of the river is stiff, hard clay, covered with boulders and gravel to depths of from 5 to 14 ft. The only appearance of recent scour was where some landing piers or cribs for the transfer had been built on the right bank. These piers were located close together, and the scour between them had deposited considerably large piles of cobble-stones below the line of piers. No scour occurred around the piers on the left-hand side. The time had now arrived when some more extensive plan for a permanent crossing must be decided upon. The question was whether to construct a large transfer steamer, with permanent landings, or a bridge. An iron bridge with masonry substructure was out of the question. An estimate of the cost of a combination bridge, with crib piers resting on pile foundations and filled in stone, showed that it would not greatly exceed that of a transfer. The climate of the vicinity is very dry, and it was reasonable to suppose that the wood work of a combination bridge, if kept painted, would last without renewal 15 to 20 years.

The question was finally decided in favor of the bridge. The superstructure consists of one draw 237 ft. long, of iron, nine 250-ft. combination spans with iron floor beams and stringers, and two 50-ft. spans of plate girder.

The piers were designed as follows:

A crib of 10 x 16 in. timber framed with pointed ends was sunk to the bottom of the river, it being of such a height that its top should be three feet below low water. The crib had tie-pieces of timber from one side to the other, their ends dovetailed into the sides and the whole thoroughly drift-bolted together. The space inside was filled with piles as close as they could well be driven, extending down into the clay, after which the piles were cut off at the same level as the top of the crib. The interstices were then filled with fragments of rock. A timber grillage, strongly drift-bolted together, was then sunk onto the piles and drift-bolted to

the sides and ends of the crib. On top of the platform another crib was built of 10 x 16 in. timber, with all sides battered 1 in. per foot except those forming the up-stream end, where the batter, to a point above the high-water mark, was greatly increased so as to form an ice-breaker. The spaces under each bridge seat were partitioned off and filled with concrete to within 4 ft. of the top. On top of the concrete were laid two courses of stone to form the bridge seats. The concrete was used for the reason that timber between high and low water marks would be liable to rapid decay. The concrete pedestals would be sufficient to sustain the weight when it should be necessary to renew the portions of the cribs most liable to decay. The piers were placed with the object of allowing permanent piers to be constructed against their up-stream ends, so that when the new piers are all done the spans can be moved over onto them.

The iron work of the combination spans was designed to allow of replacing the wooden parts with iron, should it be desired, without throwing away any important pieces, and without taking the lower chords, floor girders or lower lateral system apart. No two pieces of timber in the trusses are permitted to come into contact with each other—thin iron plates being inserted between abutting ends of chords and between the sides and ends of packing blocks and the notches in the timbers.

The contract for the iron work was let to the Rochester Bridge and Iron Works. That for the timber, foundation and erection to Hoffman & Bates. Work at the site of the bridge was commenced in September of 1887 and completed in July of 1888.

This bridge (as well as the above mentioned 300 ft. spans) was designed and engineered by Mr. L. L. Buck, Mem. Am. Soc. C. E. (at that time of the firm of Buck & McNulty), assisted at the bridge site by Messrs. Albert Riffle, W. H. Wightman and P. V. Anderson.

The illustrations show:

Fig. 1. An elevation of the draw span and of two of the nine combination spans.

Figs. 2, 3 and 4, details of the truss and floor systems of the fixed spans.

Fig. 5. The arrangement of the top of the A frame of the draw for the purpose of adjusting the ends.

Fig. 6. The strain sheet for the fixed span.

The loads and strains used were as follows:
Live load on track: one decapod engine, weighing 231,000 lbs., on five pairs of drivers, with wheel base of 17 ft., followed by a train weighing 3,000 lbs. per lineal foot.

Dead load: Weight of bridge and track assumed at 2,350 lbs. per lineal foot.

Strains allowed per square inch.

	Lbs.
End suspension eye-bars.....	6,000
Counters.....	8,000
All other.....	10,000
Lower flanges of floor beams.....	8,000 net section.
Upper flanges of floor beams.....	7,000 gross "
Lateral rods.....	15,000
Main truss compression members (as per formula in N.P.R.R. specifications.)	
Lateral struts.....	1,000
Bearing on end of wood.....	12,500
Bearing on end of iron.....	8,500 net section.
Riveted members in general.....	7,500
Splice plates.....	

Essays on Track Work.

Three of the papers presented to the American Society of Railroad Superintendents at its last annual convention, in competition for the prize for the best essay on track work, have been selected for publication in the printed transactions of the society. The three thus selected are by Andrew Morrison, White Haven, Pa., which is the prize essay; by Edwin A. Hill, Real Estate Agent, Cleveland, Cincinnati, Chicago and St. Louis, and by Jon Quil, whose name and address are not yet known.

The prize essay by Mr. Morrison is written entirely from the standpoint of the trackman, and will undoubtedly be of much interest and value to the men for whom he especially writes. He begins with the subject of trimming the roadbed after it is turned over by the contractors, and proceeds logically through the different stages of tracklaying, and then discusses joints, surfacing, lining, elevation of curves, frogs, switches and cross-overs and a great number of details of the care of track. He gives also a brief synopsis of the methods of preserving cross ties and the economies to be secured thereby.

He recommends the use of tie plates on curves, but does not think that they will pay on tangents. He recommends, also, boring the ties for the spikes, not only for increased adhesion, but to prevent the breaking up of the fibres, which promotes more rapid decay. He finds also that a diamond-pointed spike is better than one with a chisel point. In his discussion of antiseptic method of treating ties he naturally comes to the conclusion that creosoting is the only method that has so far seemed to merit a trial.

Mr. Morrison makes special mention of the mitre-cut rail, which has been adopted as the standard of the Lehigh Valley. The end of the rail is now cut at an angle of 55 degrees. The rail is 76 lbs. to the yard, of the Sayre section, and the joint the Fritz-Sayre splice, 30 in. long, with 6 bolt holes. The angle plates are made of steel. The joints are so laid that the traffic will run with the mitre on one rail and against it on the other. These rails have not yet undergone severe tests on curves.

Mr. Morrison strongly urges the use of spiral approaches on curves, and briefly describes a method essentially like that mentioned by Mr. C. James Morrison, of Shanghai, China, in the *Railroad Gazette* of Sept. 27, which consists in running in the curve from two auxiliary tangents inside of the main tangents, and joining this curve to the main tangents by curves run through points easily fixed. He says: "I have moved an eight-degree curve in this way only 12 in. towards its centre with such success that a train running 50 miles an hour would enter so naturally that the swing was not perceptible riding in even the rear car." And he is satisfied that a train at a speed of 60 miles an hour would have taken the curve just as comfortably.

Mr. Morrison is not a great admirer of stone ballast, although it is superior to any other for cleanness, durability, absence of dust and drainage. It is the most expensive to prepare and to deal with in the track, and he considers it impossible to obtain a good surface or line with stone ballast. It also causes very rapid wearing out of the ties. Slag he considers a very excellent, cheap ballast, but anthracite cinder he considers the best as regards heaving from the frost, and says that he knows of track being ballasted with cinder six years ago that is in as good condition to-day as when the ballast was first put in. It is, however, very dusty.

Mr. Morrison devotes considerable space to the matter of frogs, switches and cross-overs. He says that the frog and switch work is the most scientific in the calling of trackmen, and is looked upon by them with more or less pride. "Any trackman who rides over the road and notices the curves and switches can size up the road-master in much less time than it would take me to write it."

He believes strongly in the system of paying premiums and recommends a premium of \$100 for the best division, payable to the division roadmaster, one of \$50 for the best section in each division, and one of \$25 for the section showing the greatest improvement during the year.

The paper by Mr. Hill is written rather from the standpoint of the engineer than from that of the trackman's work. In discussing the matter of line and surface, he says that for adjusting minor defects of line nothing can

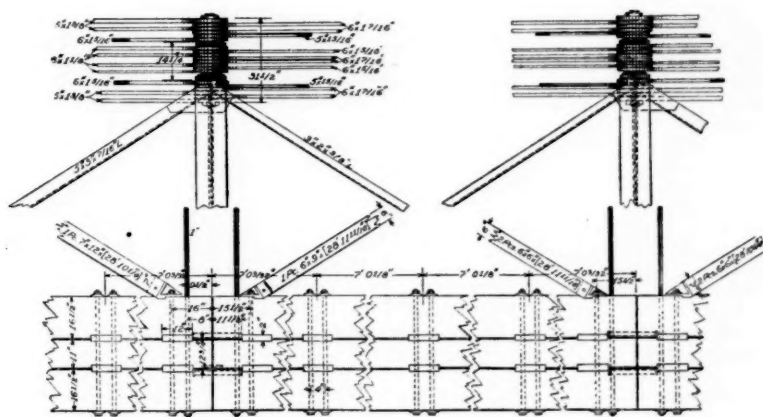
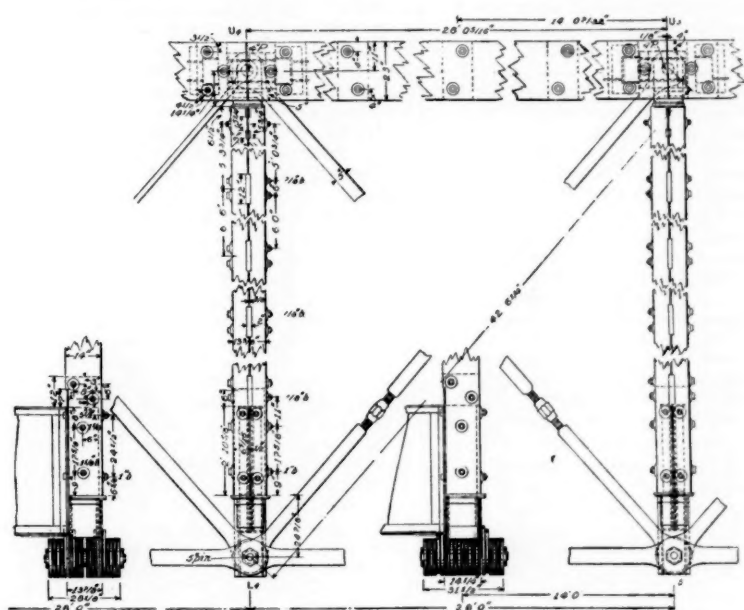


Fig. 3.

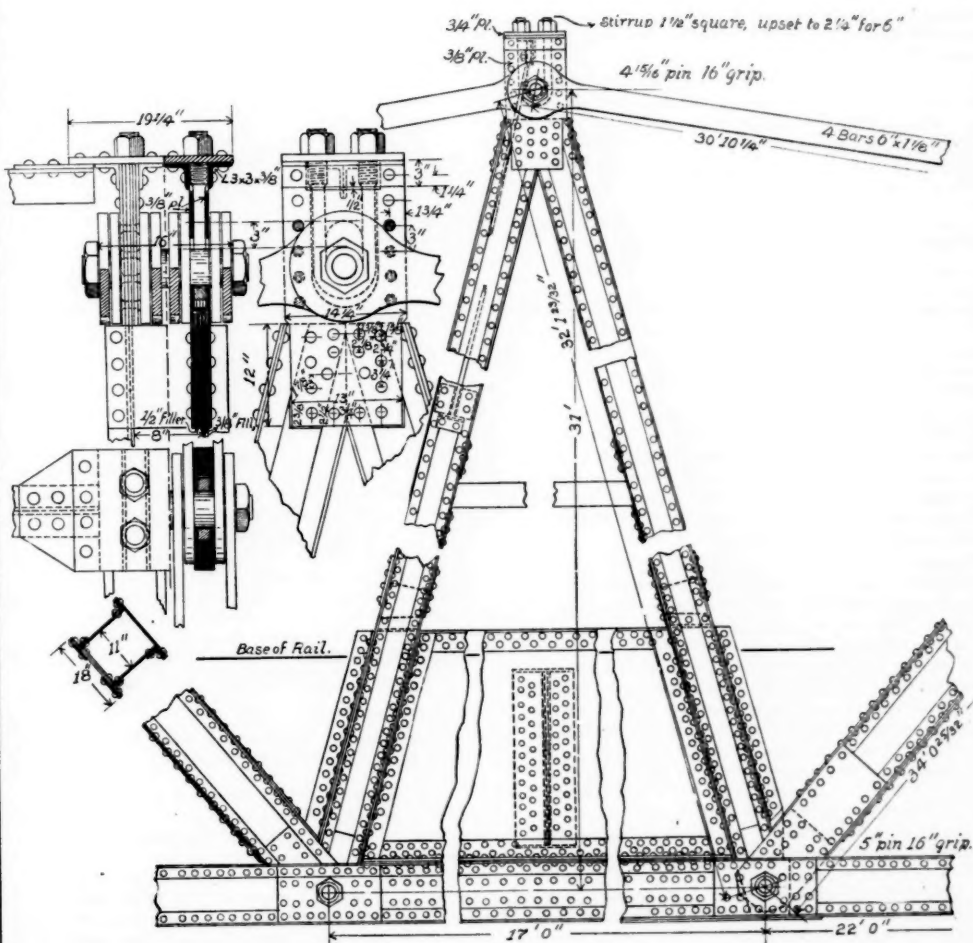


Fig. 5.

KENNEWICK BRIDGE—NORTHERN PACIFIC RAILROAD.

excel the eye of the practiced trackman, but where long stretches of track are to be lined, centre plugs should be set by transit. For surfacing the line rail the trackman's eye is again a very fair instrument, but it is of no account whatever when we get to the gauge rail. Here the invariable rule should be to bring the track into true gauge and tamp up the gauge rail at each joint until the track level shows true surface there. "The almost universal tendency, which should be carefully checked, is for the trackman to consider himself superior to the use of the track level and to leave this indispensable tool in the section house. Its constant use should be insisted upon, even to the point of discharge when necessary."

Mr. Hill thinks that, as a rule, better results are obtained by preserving the exact gauge everywhere, except that on sharp curves a slight spreading may sometimes be advisable. He discusses at much length the question of superelevation of the outer rail on curves, and concludes that it must be adjusted to the average speed of the fastest trains. It should always be such that the fastest trains will take the curve easily and the slow-moving trains should be left out of consideration. The full elevation should be required at tangent points.

The importance of a uniform degree of elasticity in the permanent way is pointed out. This requires uniformity of ballast in quality, quantity and disposition, cross-ties equally spaced and of similar dimensions, and material and rails so joined that their resistance to bending is the same at all points. "Evidently, we here require things more or less impossible, and the ideal track does not exist." The writer discusses the various items which go to make up the permanent way with a view to adjusting, as nearly as practicable, their proper relations in his approximation to the ideal track. In this way he considers the ballast, the ties, the joints and the fastenings. Of course, he thinks gravel and stone the best material for ballast, and says that broken stone is generally preferable, but where first-class gravel can be had it may give better results, for the reason especially that stone is so much more rigid. If, however, gravel contains loam or any matter soluble in water, it becomes objectionable. Generally the question of stone or gravel is one that must be settled in each individual case. What is best for one locality is not best for another, relative cost being considered. It must be remembered that the great advantages of stone are perfect drainage and freedom from dust, and that with good gravel an increase of depth will often drain a road nearly, or quite, as well as if it were ballasted with stone. Prevailing practice would indicate using not less than 12 in. of broken stone under the ties, or from 18 in. to 3 ft. of gravel, according to its quality.

Mr. Hill devotes considerable space to the question of drainage, as do all the essayists whose papers we are considering. He also makes a careful study of the dimensions and spacing of cross ties, and of the relation between the number of ties used and the weight of rail. Under the general heading of the economy of cross ties he considers, also, preservative processes. All of this chapter of the essay is too voluminous and closely reasoned to be profitably treated by abstract.

In speaking of spiking Mr. Hill calls attention to one little axiom, which is not always borne in mind in practice. That is, that the two inner spikes should be set on one side and the two outer spikes on the other side of the same tie, so as to hold the tie the better against slewing, thus contracting the gauge and introducing the evils of unequal spacing. "When spikes are drawn the hole should be plugged with a wooden plug, which will greatly prolong the life of a tie. But practically this is one of the most difficult things to beat into the mind of the average section foreman."

Mr. Hill indorses the three-tie angle splice as the best yet devised for roads of heavy traffic. He recommends a premium system, and thinks that the section foremen should be the inspectors and judges in the award of premiums.

The essay contains quite a chapter on the laying out of switches and crossovers and the use of split switches, with also a brief note on interlocking, and closes with a list of books, pamphlets and periodicals especially serviceable to those interested in track work, and especially refers to articles which have appeared from time to time in the *Railroad Gazette* on these subjects.

The essay of Jon Quil is voluminous, containing over 20,000 words, and is very carefully written. He goes over the same field, naturally, as is examined in the other two essays, introducing, of course, some variation in his manner of treating the various topics.

He considers as ideal ballast a layer of broken stone from 8 in. to 1 ft. thick on the roadbed, covered by from 4 to 6 in. of gravel immediately under the ties. Where roads are ballasted with "mud," it frequently happens that the roadbed becomes so saturated during long rains as to make it impossible to keep up the surface, and tamping is useless. In such cases he has managed to keep the track in a serviceable condition for some time by using sod, coarse grass, or even brush from tree-tops, especially pine, for tamping under the ties. He mentions one case of a particularly difficult cut which he had to deal with. This was about 20 ft. deep, and about 300 ft. long, and at the head of a small, natural drain. During wet weather one side of this cut would slough off, sometimes raising the track as much as 3 ft. in one night. Tons of this earth were removed as it slid down, until the side of the cut had been taken away for some

70 ft. from the track, and still the difficulty was not overcome. Tile drainage was tried, tiles of 6 in. in diameter being laid parallel with the track, and $3\frac{1}{2}$ ft. below its level. The first wet spell after this the track began to rise, and eventually the tile drain was broken up and the tiles were carried completely across under the track into the ditch on the other side. Soundings showed that the soft mass extended about 30 ft. below the track. This case was finally successfully treated by driving sheet piles about 8 ft. from the track to a depth of 20 ft.

The writer has often heard it stated that angle plates should not be slotted in the centre, but as he has never seen an angle plate break from below, he considers this objection not valid. He has also often heard old foremen say that it is impossible to keep track from creeping, whatever fastening is used, but he has been able to demonstrate the fallacy of this idea. In one case he had a trestle half a mile long, approached by a heavy down grade for nearly two miles. The movement of the rails was so great as to necessitate, in hot weather, the employment of a special watchman. It generally moved in one direction, till it was met by the resistance of a short ascending grade, but occasionally there was a sudden change in the direction of this movement, under a heavy train, which several times tore the joints loose and left an open space of from 12 to 18 in. At other times the joints became jammed and the track buckled. No amount of spiking would hold the rails. The spikes would be either broken or drawn, or pieces broken out of the angle plates. Eventually he had short blocks placed between ties at various intervals on the grade, and all joints spiked securely. This caused the ties so blocked to act together in a solid mass and effectually prevented the movement down grade. On the bridge he bolted a pair of angle plates to the centre of each rail and spiked them through slots, so that the expansion of every rail should be from this centre fastening toward the ends. Since the track was treated this way six years have elapsed, and there is no trouble from creeping. This same method has been tried on other portions of the road with equally good results.

He has found that on 600 miles of road the labor on bolts and joints, which was principally in tightening bolts, amounted to \$12.43 per mile (per annum ()), without nut-locks. By using nut-locks, this expense has been reduced to within \$4 per mile, and the life of the bolts has been doubled. The writer has made numerous tests with nut-locks of various classes, and has found that an elastic nut-lock yields much better results than a rigid one.

On the matter of cattle guards this essayist differs from the others. He does not consider the surface guard an adequate protection. He once experimented with one of the most promising of these by penning up some cattle and then letting them out over the guard. They crossed it quietly and with little difficulty.

He formulates a code of general rules for the roadway department, including the equipment and furnishing of a roadway train. He strongly recommends a system of apprenticeship for training up section foremen. Good foremen do not travel around seeking work, and the road must depend upon its supply of home material for getting its foremen. He therefore recommends the organization on every road of a gang of apprentices, which shall be under the direction of a competent foreman, and so located as to be frequently under the eye of the roadmaster. This gang should have the responsibility of a section where the greatest variety of conditions exists, including, if possible, a yard. Its members should be detailed for special work, such as clearing wrecks, work at washouts, building sidings, putting in new switches, crossings, turntables, signals, etc. It should be regularly instructed in the rules of the road and the interpretation of standard drawings.

The writer has elaborated a careful system of record of material and labor expended in the track department, the object of which is to determine the cost on each section of the maintenance of every frog and switch, every mile of main track and of fence, every cattle guard, etc., during the year. In this manner the roadmaster can prepare at stated intervals reports from which the engineering or accounting departments can get the basis for estimating the material and labor required annually.

The subject of inspection and premiums is very fully considered in this essay, and the writer gives long extracts from a system of inspection and rules for inspectors that he assisted in formulating for a leading line of railroad. This is very comprehensive, but we shall attempt no abstract of it, as it will (with all of the essays) soon be in print in the published transactions of the Society.

The New Locomotives for the New York, New Haven & Hartford.

The following are extracts from the specifications of eight-wheel, 18 x 24, engines built for the New York, New Haven & Hartford Railroad Co. by the Rhode Island Locomotive Works. These engines are now in passenger service, but are designed for use in either passenger or freight. It will be noticed that they have less weight upon the drivers than is customary at the present time for the dimensions of the cylinders, and probably less weight than almost any locomotive built for a long time past. Whether such locomotives will prove to be economical in service it is

difficult to say, because so much depends upon the method of operating them. In any case, it is evident that the steam used in such cylinders as these, with so little weight upon the drivers, will be well expanded, and if there is any advantage in using greater expansion in locomotive engines without compounding than that which is commonly used, such advantage ought to become evident from the results of actual service with these locomotives. In general design, these engines are not unlike those used heretofore on the New York, New Haven & Hartford. This road now has some of the heaviest, as well as some of the lightest, locomotives in proportion to the cylinder power that have ever been built, and is in a position to make a most conclusive test of the comparative merits of the two types, and it is to be hoped that such tests will be made for the benefit not only of the company but of railroad mechanical officers in general.

SPECIFICATIONS.

Dimensions: Cylinders, 18 in. by 24 in.; driving wheels, 5 ft. 3 in. outside of tire.

Fuel: Bituminous coal.

Total wheel base of locomotive and tender, 43 ft. 6 in.; total length of locomotive from point of pilot to end of tender, 50 ft. 2½ in.; rigid wheel base, 8 ft.

Weight in working order, 88,000 lbs.; on drivers, 54,000 lbs.; on truck, 34,000 lbs.

Boiler of the best quality of "Otis" steel. Thickness of shell, ¾ in.; thickness of front and back flue sheets, ¾ in.; thickness of crown sheet, ¾ in.; thickness of back and sides of fire-box, 5-16 in. All longitudinal seams to be butt welded with inside and out. Boiler to conform to drawing furnished by the company in every particular.

Fire-Box: 33¼ in. wide inside at bottom and 73¾ in. long outside; water space at bottom of sides of fire-box 3 in., at front 3½ in., at back 3 in.

Crown Sheet to be stayed with double crown bars not less than ¾ in. thick by 6 in. wide and placed not over 4½ in. apart between centres. All rivets in fire-box, except water-space ring, to be headed on inside. Holes to be countersunk on inside to depth of one-third thickness of plate, and of diameter 1¼ in.

piston Rods of Krupp steel, to be secured to cross-head by steel key, and to piston by steel dowel pin, ¾ in. diameter, to be tapered ¼ in. to the foot. Rod to be riveted into piston.

Guides of wrought iron.

Tires: Standard steel, 3½ in. thick, back pair flanged 6 in. wide; front pair blank.

Axles of Otis steel; journals, 7 in. diam., 8 ft. long.

Cranks of best Krupp steel.

Main and Parallel Rods to be of the best quality Krupp steel. Parallel rods to be made without straps, as per drawing of "I" beam pattern.

Dry Pipe of best quality wrought iron, lap welded, outside diameter 6 in. No. 8 wire gauge. Sleeves for dry pipe of brass driven on and fastened with two rows of ¾ in. copper rivets. Sleeve at back end to be of cast iron, well fitted and screwed on pipe. T-head to be of brass, with ball joint to fit brass sleeve at front end of main dry pipe and secured to brass ring on flue sheet by six ¾ in. studs, made to drawing.

Engine Truck: Centre bearing; wheels 30 in. diameter, steel tire, with retaining rings pressed on axle of Otis steel, with not less than 25 tons pressure; journals 4¾ in. diam. by 8 in. long.

Ash Pan: Of wrought iron, extra heavy, provided with front and back dampers to be worked separately from deck of engine; connections to be notched to hold damper in different positions. Dampers and joints at top of ash pan to be fitted as nearly air tight as possible.

Dome to be 24 in. inside, to be well flanged and riveted to wagon-top sheet, and wagon-top sheet flanged into dome and riveted.

Longitudinal seams to have butt joints, with welt inside and out, and to be double riveted. Throat sheet to be connected to boiler by double riveting. Shell to be riveted with 15-16 in. rivets.

Riveting: Rivets to be placed not less than 2½ in. apart in single riveted seams, and in double riveted seams not more than 3 in. nor less than 2½ in. apart, rivets to be staggered in rows, 1½ in. apart. All riveting to be done in a thorough and workmanlike manner by machine or by the process known as set riveting. Holes to be placed far enough from the edge of the sheets, and so exactly opposite each other as to insure that the maximum strength of joints for the style of riveting specified is secured, and that drifting will not be required. Boiler to be tested at 325 lbs.; warm-water pressure, and to carry in service 180 lbs. steam pressure.

Stay Bolts to be placed not over 4 in., centre to centre, and 1 in. diameter. Hollow stay bolts for admission of air to be placed as shown in drawing.

Extra Plates ¾ in. thick to be riveted inside of sheet providing extra thickness of metal for expansion brace studs.

Annealing: All boiler plates to be thoroughly annealed after flanging.

Flues: Best quality steel, lap welded, No. 11 wire gauge 2 in. outside diameter, 11 ft. 1 in. long, 193 in. number.

Frame to be of best hammered iron, 4 in. wide and 3½ in. deep, lower rail to be 4 in. wide and 2½ in. deep.

Steam Chests of cast iron, and to be fastened with 1 in. studs. Joints to be made with flat copper gaskets.

Slide Valves: Roller valves N. Y., N. H. & H. pattern, ¾ ft. outside lap, 1-16 in. inside lap, as per drawing.

Foot Plate to be of wrought iron, ¾ in. thick, and to be covered with 2-in. oak plank properly secured in place; front end to be finished with 3-16 in. iron, properly secured to deck plank. Plates of ¾ in. iron, to be secured to quadrant and running boards, from cab bracket to boiler.

Trucks: As per drawing.

Tender Axles: Best quality of special iron to stand three blows, 1,610 lb. weight, falling 25 feet.

Wheels: "Paige" plate pattern, 30 in. diameter, well fitted and pressed on axles, not less than 25 tons pressure. Engine truck to have spoke wheel with retaining ring.

Brakes: Both trucks and drivers to be supplied with hand and power brakes, Westinghouse.

A representative of the New York, New Haven & Hartford Railroad Co. to be allowed to be present at the locomotive works while engines are being constructed, and to examine every detail of the work as it progresses and to have authority to condemn defective work.

Engines not to be accepted until they have been actually and satisfactorily started in service.

Brake Scoop: These engines to be equipped with track scoop.

Brake Shoes: Engines to be equipped with the "Ross-Mehan" brake shoe.

Tests of Steel Axles.

The Pencoyd Iron & Steel Works have issued a list of experiments made with steel and iron car axles at their works in Philadelphia. It is a pamphlet of 41 pages, containing photogravures of their new axles plant. It shows the new 20-ton hammer working a 16-in. ingot, the axle hammer with cranes surrounding it, the large furnace for the 20-ton hammer, the and 15-ton hydraulic cranes, which operate in connection with the 20-ton hammer. The cuts are excellent and show the machinery quite clearly. This machinery was referred to in the *Railroad Gazette* of Oct. 4.

The manufacture of hammered car axles of iron was commenced at the Pencoyd Iron Works in the year 1852,

The coupler shown here is one recently brought out at St. Louis by the Keystone Car Coupler Co. Its construction involves several new features which are promising. Some of the novelties to be mentioned are: A lock wholly contained within the head of the draw-bar; an unlocking lever protected from injury by the knuckle

1234		J. to L. Wis.		CHICAGO	
L. 27.		CHIC. & NOR.-WEST. R'Y.		SINGLE TRIP TICKET.	
AUDITOR'S STUB.		NOT GOOD FOR PASSAGE.			
TO BE RETURNED TO TICKET AUDITOR WITH MONTHLY REPORT					
Issued..... 18....		Void after..... 18....			
Via.....		Rate, \$.....			
Do not limit unless specially instructed by tariff or otherwise. If mistake is made in detaching Ticket from Stub or in any other way, mark it VOID and issue another.					
Jackson Janesville Jefferson Johnson's Cr.'s Juntura Kalamau Kendall Kenosha Kewaskum Kirksland Kirwood Koshkonong La Crosse Lake Geneva Lake Mills Lake Shore. Lancaster La Salle Lebanon Lehigh Little Chute Little Kaukauna Little Smeatico Livingston Lodi Lytle	JACKSON JANESVILLE, JEFFERSON, JOHNSON'S CR.'S, JUNEAU, KALAMAU, KENDALL, KENOSHA, KEWASKUM, KIRKWOOD, KIRKWOOD, KOSHCONONG, LA CROSSE, LAKE GENEVEA, LAKE MILLS, LAKE SHORE Jc., LANCASTER, LA SALLE, LEBANON, LEHIGH, LITTLE CHUTE, LITTLE KAUKAUNA, LITTLE SMEATICO, LIVINGSTON, LODI, LYTTLES,	MIS 1 MIS 2 MIS 3 MIS 4 MIS 5 MIS 6 MIS 7 MIS 8 MIS 9 MIS 10 MIS 11 MIS 12 MIS 13 MIS 14 MIS 15 MIS 16 MIS 17 MIS 18 MIS 19 MIS 20 MIS 21 MIS 22 MIS 23 MIS 24 MIS 25 MIS 26 MIS 27 MIS 28 MIS 29 MIS 30			
<p>CHICAGO AND NORTH WESTERN RAILWAY.</p>		<p>CHICAGO</p> <p>To Station Named in the Margin.</p>			
<p>PASSAGE ONE</p> <p>VOID AFTER..... 18....</p>		<p>{ To leave selling station at..... M., on date of sale.</p> <p>{ To arrive at destination at..... M., on date of limitation.</p> <p>(Above spaces to be filled in only when limited as to time or to continuous trains.)</p>			
<p>L. 27.</p> <p>1234</p>		<p>NO STOP-OVER ALLOWED IF LIMITED.</p> <p><i>E. A. Washburn</i> General Ticket Agent.</p>			

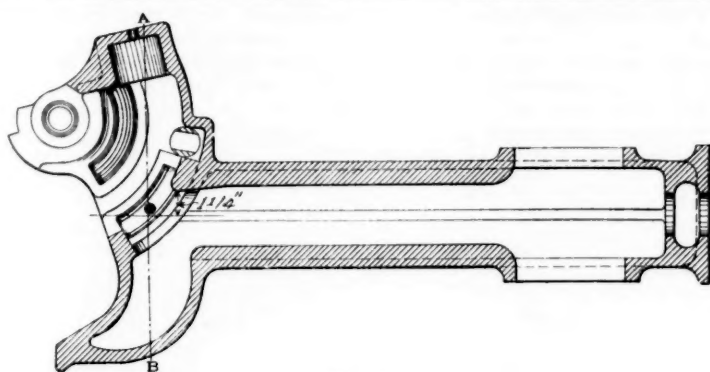


Fig. 1.

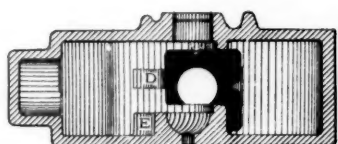
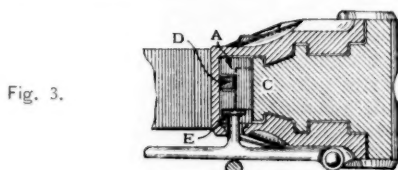
Fig. 2.
Section on A B.

Fig. 3.

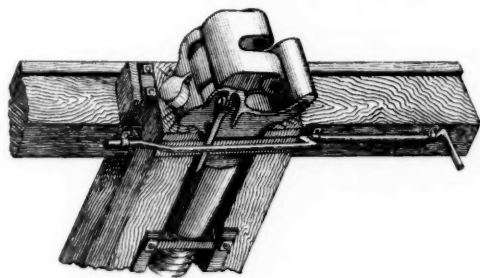
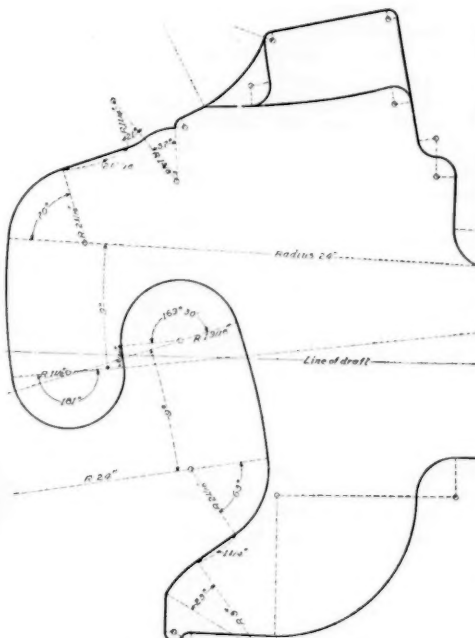


Fig. 5.



Contour of the Keystone Coupler.

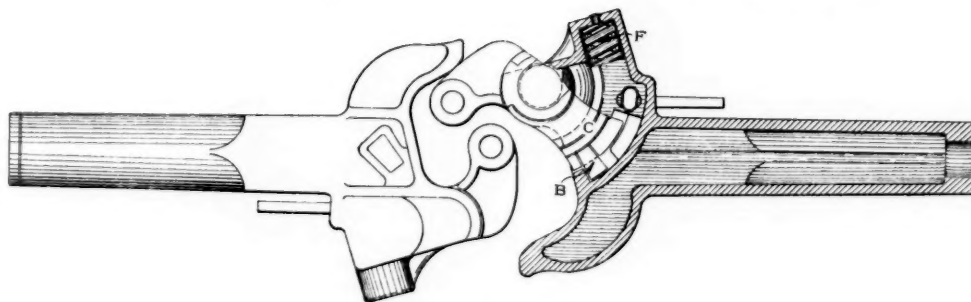


Fig. 4.

THE KEYSTONE COUPLER.

Made by the KEYSTONE CAR COUPLER CO., St. Louis, Mo.

a knuckle cushioned after it is locked; a locking pin which travels with the knuckle; a hollow malleable-iron knuckle; a locking pin wholly within the head, and a coupler with no openings on top through which water can reach the interior.

A description of this coupler is as follows: In the malleable-iron head are cast grooves which fit corresponding grooves on the top and bottom of the knuckle, as clearly shown in figs. 1 to 4, inclusive. These grooves are concentric with each other and have their centre at the centre of rotation of the knuckle and form its bearing. The locking pin A, fig. 3, and B, fig. 4, is carried with the inside arm C of the knuckle. When the knuckle rotates it carries with it the locking pin, but when the knuckle reaches the locking position this pin drops behind the shoulders in the head, shown at figs. 2 and 3 at D and E, and holds the knuckle from further outward movement, but permits it to go inward and be cushioned against the spring F, fig. 4, when it receives a buffing blow.

Fig. 1 shows a section of the draw bar arranged for the American Continuous Attachment, and also shows all of the interior grooves and recesses. Fig. 2 illustrates clearly the location of the locking shoulders in the head and the seat for the cushioning spring. In fig. 3 can be seen the concentric bearings for the knuckle, the locking pin in the unlocked position and the unlocking lever in the highest position where it raises the locking pin to the unlocked position. The couplers in the act of coupling, the cushioning spring, and the knuckle and the lock are best understood from fig. 4. In fig. 5 can be seen the whole apparatus mounted ready for service.

The difficulties which have from time to time arisen with various types of the Master Car Builders' standard

coupler, and which it is designed that this coupler should remove, are about as follows: Breakage of the knuckles at the base of the lugs on the outward arm, fouling of the unlocking devices in service, rapid wear of the knuckle pivot, rapid wear of the lock and a configuration of outline which permits the couplers to uncouple before being worn out. It is also intended eventually to place a steel plate on the interior face of the knuckles to prevent the rapid wear of the surfaces at that point in the case of passenger service where chafing plate springs are used and in long-continued freight service. The diagram accompanying the illustration shows the configuration of the knuckles and the head of this new coupler.

The following extracts from a description of the coupler given in a circular by the Keystone Co., further state the claims made for it:

"The spring in the head acts as a buffer, and when the knuckle is in closed position absorbs the first shock of impact. * * * Under heavy blows the spring compresses one-half inch, the rear arm of the knuckle being free to travel that distance before it strikes the solid metal, which prevents further compression of the spring, and saves it from breakage. Further, this spring allows the coupler to be fully locked before it acts, so there will be no danger of a rebound preventing a coupling. This spring is, therefore, a buffer pure and simple, and is not intended in the slightest degree to assist in the opening of the knuckle.

"The difficulty heretofore has been that the uncoupling attachments have been made as an absolute connection between the coupler and car, which an extreme movement of the coupler would bend or break, or they were so arranged as to frequently slip out of proper engagement and catch on shoulders or projections, and would then by a reverse movement be bent or broken. Some would not act if the coupler moved out of its ordinary position, and many were exposed to projecting freight on flat cars, or to blows from bumping posts, or the draw-

heads of high or low cars that would pass either above or below the coupler. In the case of the Keystone, neither the uncoupling rod nor lever project far enough below the coupler to be injured by anything that might pass below, and the uncoupling rod does not extend beyond the car to be bent or otherwise damaged. No movement of the coupler can cause any of the parts to become so engaged as to cause them to bend, and the coupler can be pulled entirely out without in any way injuring the uncoupling attachments.

"The whole interior of the knuckle is cored, and the walls thus formed have ribs projecting laterally, which brace the walls and make them very strong. Knuckles made after this design have given the most complete satisfaction, and are light and very cheap to replace if any are broken.

"One more feature of this coupler deserves attention, which is, that there are no openings above of any kind to admit either dirt or moisture, and all working parts are thus thoroughly protected, and cannot be impeded in their action."

The following from the circular applies as well to all of the better types of M. C. B. standard automatic couplers:

"It might be well in describing this coupler to mention the question of expense connected with the use of the M. C. B. type, as against the ordinary draw-bar and link and pin. It is generally understood and conceded that the cost of application is more than that of the common coupler, and the idea also seems to be prevalent that its maintenance is going to be vastly more expensive. But if any one will stop to consider this point the last will be plainly seen to be a mistake. The part of the M. C. B. coupler where breakage will almost always occur and subject to the most wear will be the knuckle; the draw-head and bar will generally last an indefinite time. The cost of replacing even the most expensive knuckle made is much less than the cheapest ordinary draw-bar, and the cost of replacing a 'Keystone' knuckle is an insignificant figure in comparison. Taking into consideration that the life of a knuckle should equal at least that of an ordinary draw-bar, and not counting the saving of links and pins, a factor which has always been considered in favor of the application of M. C. B. couplers, it will be seen that the cost of renewals of these couplers will be less than the cost of replacing broken common draw-bars, and in the course of time the extra cost of equipment will have disappeared, and from that time on a saving of expense will follow."

TECHNICAL.

Improvements in Electric Train Lighting.

Mr. A. H. Bauer, manager of the electric lighting department of the Pullman Co., has just completed the electrical equipment of the "Montezuma" special, a train of four improved Pullman vestibuled cars that are now on exhibition in Chicago, preparatory to being taken over the "Monon Route," via Louisville and Chattanooga, to New Orleans, and thence to the City of Mexico.

Mr. Bauer has placed 30 sixteen candle-power Edison lamps in the "Superb," arranged on two distinct circuits, termed the "end circuit" and the "body circuit," running directly from the cells to a switch and cut-out case placed within a convenient locker, and holding the four safety strips. This arrangement permits of easy and economical handling of the all-night lights in the vestibule and toilet rooms. Each lamp is also supplied with a key socket, so that a particular light may be turned down by the occupant of a berth, while in the corner of each section silvered thimbles have been placed, in which may be inserted a portable lamp with frosted bulb connected to the branch wires by means of a flexible silk cord, the terminals of which are inserted into sockets placed in a rosette above the section mirror, thus affording any desired angle of light should the occupant prefer to read while reclining. Mr. Bauer has so placed the lamps in the composite car and in the dining car that the light falls directly from above and over the shoulder of the tourist, while fans revolved by electric motors are furnished when desired by invalids or others, the motor being connected in the same manner as the portable lamp.

The electric current is supplied by two sets of storage batteries placed underneath and on each side of each car in the train. The new type of cell, 23 M, made by the Electrical Accumulator Co., of New York, is employed, and it is charged with current from an Eickemeyer dynamo driven by a Brotherhood engine. This plant is placed in one corner of the composite car and includes an automatic lubricator holding two gallons of oil, steam gauge, voltmeter, ammeter and a Schaeffer & Budenberg tachometer, as furnished on all the Pullman trains. Speaking of the excellent service given by the Eickemeyer dynamo and of the slight attention required, Mr. Bauer stated that the machine, now in service, had been run continuously for five months with an overload, and yet there had not been the slightest sparking at the brushes or trouble of any sort. The present machine gives 90 volts and 85 amperes at exactly 850 revolutions. Mr. Bauer will accompany the Montezuma special on her maiden trip as far as New Orleans and probably through to the City of Mexico and return.

Mr. Bauer lately referred to the question asked by Mr. A. L. Lang at the meeting of the railroad telegraph superintendents regarding the belting of the dynamo to the axle, and stated that a thorough experience under various conditions had demonstrated the impossibility of securing even fair results in train lighting where the power was supplied by the axle, owing to the constant change in speed and the numerous curves found on American railroads, around which the wheels will often slide without turning the axle a single revolution, thus playing the mischief with belt and armature. But Mr. Bauer said that such a method was employed by Mr. H. O. Houghton in securing current for the train lighting on the London & Southwestern Railway in England. During a trip over that line Mr. Bauer was impressed with the conditions tending to make the system a success, and which are widely different from those prevailing in this country, in the almost entire absence of curves and the high and constant speed maintained. When the speed does vary, an automatic switch placed near the dynamo cuts out the cells, which are not distributed under each car as in the Bauer system, but all are placed in the baggage van.—*Electrical World*.

The Transatlantic Record Broken Again.

The "City of Paris," which left New York Oct. 30 for Liverpool, made the trip to Fastnet in 5 days, 19 hours and 50 minutes, thus beating the best previous eastward record, made by the same steamer, of 5 days, 23 hours and 38 minutes. The "City of Paris," it may be remembered, has made the westward trip in 5 days, 19 hours and 18 minutes.



Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

The questions of the relative position of different semaphore arms fixed to the same post, and of the correct principles to be followed in locating distant signals, are brought out in the communication on signaling printed in another column and are worthy of note. The letter has other points of interest, notably that concerning nomenclature, but we will not discuss them now. The use of a single arm with a number of indicators, instead of a separate arm, for each of several diverging tracks, is now so common and so well liked that practice must be conformed to it, even at the expense of a radical change. Where switching tracks diverge to the right of the main line the old principle would require the secondary arm to be placed above the main line semaphore, and there would be no great objection to this; but if other tracks diverged to the left at the same point the principle could not be adhered to without the use of an additional semaphore. In order, therefore, to stick to the plan of reducing the number of arms as much as possible it becomes necessary to abandon the system of placing the arms always in the same relative position to the tracks. In the case we have supposed, the arm would be wrongly located for a portion of the tracks at the best. Of course if the Pennsylvania Company has much of the older style in use on its lines it is desirable that this change in standards should be very fully explained to its engineers.

The Pennsylvania Company does allow a good deal of difference in the distance at which engineers shall receive warning by distant signal, but its limit is certainly an improvement on the practice of the roads which have no rule at all. The shorter distance (1,000 ft.) affords a sufficient warning in all ordinary circumstances. In doubling this the Pennsylvania Company is recognizing in a moderate way the views of the great number who believe in providing, at all dangerous places, a warning which shall give the most careless engineer room enough in which to stop. Probably nothing but the mechanical difficulties and the expense have prevented many signals from being located 3,000 ft., and even farther, from the danger point. This absurd distance, nearly three-fifths of a mile, is the standard on the London & Northwestern, but is to be accounted for there by the fact that the antiquated practice of running long freight trains consisting mostly or entirely of unbraked cars, at pretty high speed, is still common, if not universal. A standard is certainly desirable, but whether it should be one measured exclusively by distance or should be based on the relative difficulty in stopping a train is more of a question. In erecting "mile-boards," and in other circumstances, distance only is considered; if the grade is unfavorable, the engineer and brakemen must make their own allowances. The London & Northwestern standard distance is allowed to be reduced 20 per cent. (to 2,400 ft.) on ascending grades, but with either distance a train with a power

brake has much more space than it needs. This is undesirable, to say the least; but as long as one class of trains requires three times as much room as another there is no help for it, even if the location of the signal is varied precisely in accordance with the steepness of the grade, which leaves us with no uniformity at all in distance. A rigid limit, the same on ascending as on descending grades, implies a rule that the speed of trains must be more carefully regulated when going down hill than at other times. As this extra care has to be exercised much of the time, anyway, there is considerable to be said in favor of a uniform distance.

In another column is a description of the new locomotives for the New York, New Haven & Hartford, built by the Rhode Island Locomotive Works. We desire to call attention to the general proportions of the locomotives because they are quite unusual. The novelty lies in this selection of proportions: Cylinders, 18 in. x 24 in.; drivers, 63 in. diameter; steam pressure, 180 lbs. per sq. in., and weight on drivers, 54,000 lbs. In the *Railroad Gazette* of April 26, 1889, page 272, will be found a table of coefficients of tractive power of locomotives. From this table it will be seen that the coefficient for a locomotive of such proportions is about 123. Using this coefficient to obtain the mean tractive power, on a basis of a mean effective pressure equal to 85 per cent. of the boiler pressure, it is found to be 18,819 lbs. In the contribution just referred to there will be found a comparison of locomotives of three classes with reference to the proportion of the weight available for adhesion to the mean tractive power, calculated on a basis of 85 per cent. mean effective pressure. The comparisons show the extreme limit to which locomotives had been built in this country, so far as learned by the writer of the article at the date of the publication. The lowest limit of weight in proportion to mean tractive power, in switching service, was found to be 3.37, in freight service 3.23, and in passenger service 3.58. In the case of these locomotives of the New York, New Haven & Hartford, the ratio is $\frac{54,000}{18,819} = 2.87$. It will thus be seen that these engines have the least weight upon the drivers in proportion to the power of the cylinders of any locomotives that are known to be in ordinary service. However, a few years since some locomotives with 19 x 22 in. cylinders and 57 in. wheels were built for the Missouri Pacific which had a ratio, on this basis, of 3.15. Just what is the object of such light weight in proportion to the cylinder power does not appear, unless it be the intention to test the value of increased expansion in one cylinder. The action of this design in service will be watched with interest by railroad men in general, and more particularly by those who are looking toward compounding to obtain more economical engines.

It will be noticed that the term "mean tractive power" is used in the preceding note in the place of "tractive power," generally used in such connection. From a mean effective pressure only a mean tractive power can be deduced, and if this is borne in mind when estimating the starting power of locomotives, an error often made will be avoided. It may be, as can readily be seen, that the mean tractive power, as obtained from the common formula $\frac{D^2 PL}{W}$ will exist only for an instant, if at all, during a given stroke, at other times the tractive power is either less or greater. The power of a locomotive at starting varies with the position of the cranks and valve gear, and to obtain the exact force on the drawbar it is necessary to know the location of those details; the mean tractive power indicates only the mean pull on the drawbar during a revolution. It is to be hoped that the careful study of the power of compound locomotives now in progress in this country will bring this point forcibly to the front, and perhaps result in the selection of a satisfactory basis for comparison of the power of locomotives of different designs.

With reference to the mean tractive power of a locomotive, there is another point of interest. It is this, all locomotives, even when they have the same boiler pressure, diameter and stroke of cylinder and diameter of drivers, do not have the same tractive power as the formula generally used would indicate. The reason of this is that the mean effective pressure is different for each design of valve gear, and it varies considerably from the assumed 85 per cent. of the boiler pressure. Some passenger engines cut off steam in full gear at 18½ in., others at 21½ in. Freight engines vary from 20 in. to 22½ in. in full gear. It will thus be seen that the highest mean effective pressure, which is that considered when estimating the power of a locomotive to start a train (provided the weight is sufficient

to hold the drivers to the rails), varies considerably, and should be determined for each case. No true comparison can be made of the starting power of locomotives unless these differences in design are determined.

The present season is in some respects remarkable for its combination of low rates with large traffic. In old times when a road obtained more business than it could readily handle it stiffened its rates. Supply and demand in transportation were thus equalized by the same process which prevails in other lines of business. At present this is impossible. The law renders it difficult to raise rates by the same gradual process which was usual a few years ago. It cannot be accomplished by the exercise of discretion on the part of freight agents. It requires a change in the tariff, and this cannot always be accomplished without the co-operation of connecting lines. Thus the demand for transportation may remain for a long time in excess of the supply. Such a state of things is felt now at hundreds of places and by nearly all roads, notably by the Pennsylvania at Pittsburgh, and by the Lake Shore at Chicago. The latter road, if accounts are to be believed, is temporarily refusing certain kinds of freight and confining itself to its more profitable business. Doubts have been raised as to the legality of such action; but we imagine that the road would have no difficulty in justifying it. If it is impossible to ship all goods at once, it is right to give preference to the man who pays the most. Such a course might open the way for discrimination, but it would not be discrimination in itself. If such a state of things continued for any length of time it might lead to some curious results in the way of division of labor between different roads, in which each should make a specialty of certain classes of through traffic. To a certain extent something of the sort has always existed, the best roads carrying the greatest proportion of high-grade traffic; but this difference is sure to be intensified under conditions like those which now prevail.

The strike of the yard trainmen at Memphis, Tenn., fell through last week, the companies having little trouble in keeping their trains moving, and the men giving in. There are some eight or ten roads in Memphis, and their yards are considerably scattered. No one of them employs a very large number of men. The police power seems to have been ample and the municipal authorities prompt and discreet in using it. This, probably, was an important factor in the early settlement of the difficulty; but a significant item in the news dispatches was the statement that one of the roads (the Memphis & Charleston) enjoyed an advantage over the others because its yards were inclosed with a fence. Every one remembers the facility with which the Chicago rowdies bothered the Chicago roads last year. In that city the running of freight cars in the streets (or over routes equally difficult to fence off) seems to be inevitable, and the question of fencing railroad premises is very complicated at a great many places, but yet it deserves more consideration than it receives. With things as they are, most conflicts with the rowdy element have to be settled more or less by temporary expedients and compromise, and a well-defined boundary line, such as is afforded by a fence, is a decided advantage, though every one admits that it is by no means an impregnable barrier to trespassers. Even where exigencies of work or the customs of the public necessitate numerous gates or other openings, it is advantageous to fence freight yards. Such openings can readily be arranged so as to be effectually closed and made on short notice as firm as the other portions of the fence. Passenger stations might often be inclosed better than they are. We read recently of certain action taken in the courts by the Grand Trunk of Canada, which indicates that the expulsion of loafers from passenger stations is not so easy under Canadian laws as it is in most of our states. We wished that the Grand Trunk officers had the advantages in this respect enjoyed by railroad officers this side of the line, but at the same time regretted that the latter make so little use of their advantage. As before remarked, the repression of the rowdy element cannot be carried out on hard and fast lines, and it is not always politic to arrest loiterers when we have the power; but a fence will often settle such matters without friction.

How shall We Call In the Flagman?

A collision at Bowerstown, O., reported in our record printed in the last issue, was occasioned by a flagman's mistaking another train's whistle for his own. A passenger train was due, and the brakeman forgot a plain rule which required him in such case to stay out and disregard the calling-in signal. The man is thus clearly to blame, and strict compliance with the rules

would have prevented this particular collision. But if the on-coming train had been a freight or an extra, the question would not have been so easily settled. With brakemen as they are, we have here a positive danger which demands investigation. If men can be so instructed that they will, instead of starting at once on hearing the whistle, always stop and ask themselves whether the signal is certainly for them and not for some one else, it behooves careful superintendents to see that all their brakemen have the benefit of the instruction, for the average brakeman probably does not fully realize or give sufficient weight to the possibilities of danger involved. It is also worth while to consider whether the conductor and engineman should not be instructed to take more care in calling in men by the whistle signal, using it less than they commonly do. Certainly they should not call in the man when a passenger train is due. The necessity of this has been repeatedly pointed out in these columns. In giving the whistle signal at such a time the brakeman is directly told to violate a rule. A brakeman's acting on a false whistle signal is believed to have been one of the causes of a fatal collision in the same state as the above, a few months ago, and the whole question is a matter of anxious thought to many careful superintendents. This anxiety is not without good cause, and we have no panacea to offer (except the block system); but it may be well to recount some of the considerations bearing on the matter, that the dangers involved may not be lost sight of from a feeling that they are wholly irremediable.

The difficulty cannot be met by any change of whistles, for whistles on another road have been known to deceive a brakeman in the night. It is impracticable to provide any signal which shall be distinctive, as between different trains, for it would require too many variations, and besides, many runners are slow to learn how to make whistle signals properly. Even separate signals for east bound and west bound are of doubtful expediency, as appears by the Pennsylvania's rejection of the Time Convention standard. The public already complains of too much noise, and it will not be good policy to increase it. It would be possible to frame a rule permitting the use of the calling-in signal when remote from other trains from stations and from other roads, but its practicability is doubtful. If the whistle call were abandoned entirely, much time would be consumed in sending a second man out to call in the first, but this seems to be the only way open. Possibly a compromise might be effected by having the man place the torpedoes and then return to a point much nearer the train than is now prescribed; and perhaps a mouth whistle or horn could be made useful. If passenger runners always kept a good lookout a man 1,000 ft. distant could give a sufficient warning to that class of trains, if brakes were always up to the right standard of efficiency, which, unfortunately, they are not.

If torpedoes could be absolutely depended upon the man might return at once without waiting to be notified, and possibly there is a field for some more elaborate and conclusive experiments with these instruments than have ever yet been made. But whatever their degree of reliability, torpedoes should at least be used according to rule; and just here is a weak point in present practice. If the man is called in before he has gone the required distance he returns without placing the exploders. This seems to have been the case at Bowerstown. This is a very difficult matter to adjust, because there are so many stoppages when the delay is very short and the use of torpedoes would be unnecessary, but under present conditions it seems advisable to consider whether a strict rule forbidding brakemen to come in and forbidding conductors and engineers to call them in until torpedoes have been placed at some point would not be an improvement. If the man has not reached the furthestmost point prescribed, why not fasten down the torpedoes right where he is? Our readers will recollect the recent communication of an Illinois correspondent referring to the possibility of a flagman falling on a slippery road and disabling himself, of his lantern going out, and other contingencies. These are sometimes very real, and our correspondent showed the misleading nature of a rule telling the flagman that he must not put down torpedoes until he had traversed the maximum distance prescribed. Certainly we should not positively forbid his placing them every five-rail lengths if he may deem it necessary; the question is, rather, if more than one intermediate audible signal should not be definitely mentioned in the rules.

But, after considering the intricate relations of all these difficult and uncertain expedients, why not cut the Gordian knot by throwing them all aside and trying the block system? The Canadian Pacific, the Wabash, the Michigan Central and other roads use it

with great satisfaction, and without great expense. It should be remembered that apparently long distances between stations are not always so great an obstacle to a cheap block system as they may at first seem. With telegraph offices five miles apart trains running 30 miles an hour, including stops, can be absolutely blocked, and yet keep within about 10 minutes of each other. Traffic can thus be conducted as rapidly as with the ordinary system and with much greater safety. Trains making few stops and running equally fast between stations could be run at shorter intervals. Where local trains cannot make 30 miles an hour it is generally because stations are nearer together; and being nearer together the blocks will be short enough to admit of a reduction of the interval between trains.

Continuous Brakes in England.

It is only in the returns of the British Board of Trade that we can find collected and published any considerable body of statistics of the working of continuous train brakes. In these returns an attempt is made to publish each half year the amount and kind of brake equipment on the vehicles run in passenger service in the United Kingdom, and a record of all brake failures. These returns are made up from reports made by the roads; and, while it is probably easy to know the amount of brake equipment of each given kind, the accuracy and completeness of the record of failures must depend upon the care with which they are observed and the fullness with which they are reported. In the few reported cases of brakes failing to stop trains when required, not enough data are given to make the returns very valuable. The weights and speeds of trains, the condition of track, the distance run after application, the condition of brake rigging, the brake pressure and leverage, and whether or not driver brakes were used are never stated. In the much more numerous cases of delays from defects of brake apparatus, enough facts are given to make the record valuable, but there is often internal evidence of want of care and want of uniformity in investigation and in reporting.

The rolling stock fitted with continuous brake apparatus which complies with the requirements of the Board of Trade was, June 30, 1889, as follows: Engines and tenders fitted with brakes, 4,038; fitted with apparatus for working the brakes, 3,263; carriages, etc., fitted with brakes, 34,060; fitted with pipes, 4,854. In all, 72 per cent. of the total passenger stock was so fitted. The Westinghouse automatic and the automatic vacuum are the two kinds of brake in much the most general use. With the Westinghouse are fitted 2,041 engines and 15,553 cars; and 5,259 engines and 23,339 cars are fitted with the automatic vacuum. The mileage run by vehicles fitted with these two brakes was 73 per cent. of the total train mileage, which was almost the exact ratio that those vehicles bore to the total stock run in passenger trains. The record of the failures of all brakes is given with equal care, but as the Westinghouse and the automatic vacuum did so large a part of the total brake service, and as they are practically the only brakes which comply with the Board of Trade requirements, their performance is a fair measure of the efficiency of the best brake equipment in Great Britain.

The reports of failures are made under three heads: (1) Failure to act when required in case of an accident to a train or a collision being imminent. (2) Failure to act, under ordinary circumstances, to stop a train. (3) Delays to traffic because of defects or failure of brake apparatus or neglect or inexperience of members of the working staff.

The trains fitted with the Westinghouse and with the automatic vacuum ran, in the first half of 1889, 53,722,000 miles without a single recorded case of a failure. This fact, on the face of it, is a striking illustration of the efficiency of a good continuous brake. There is not, however, anything to show how many times the brakes were brought into use to prevent such accidents. Only one road, the London, Brighton & South Coast, reports these cases. On that line the Westinghouse brake was used 13 times in the half year, to prevent collisions or running into animals on crossings. This was with a passenger train mileage of 3,380,000 miles. The same road reports using the Westinghouse brake 42.245 times in two days, the booked stoppages having been but 18.477. Naturally the emergency use of the brake is much less common in England than in this country, owing to the better signaling of English roads and to the infrequency of highway grade crossings.

Under the second head the failures were also very few with these two brakes. We have carefully separated those due to defects of the apparatus from those due to faults of the staff, including in the latter only those which came from faults in coupling and failures to open cocks and the like—faults which cannot be

altogether avoided by the most perfect mechanism. Of failures to work efficiently in an ordinary service stop, due to the defects of the apparatus, the Westinghouse had two, or one to each 10,340,000 train miles. The automatic vacuum had eight, or one to each 4,130,000 train miles. Of failures due to errors of the working staff, the Westinghouse had eight and the automatic vacuum had one. Seven of these errors with the Westinghouse brake were on one line with but 319,000 train miles. Obviously they can mean nothing for or against the brake.

Under the third head, delays to traffic from improper action of the brakes, including errors of the staff, the automatic vacuum had 292 and the Westinghouse had 240; excluding errors of the staff the automatic vacuum had, 275, or one to every 120,000 train miles, and the Westinghouse 221, or one to every 94,000 train miles. Of these latter, however, 150 were from rupture of hose connections. Leaving these aside, there were with the Westinghouse 71 delays, or one to every 291,000 train miles.

Comparing the two systems, it is seen that the automatic vacuum made in ordinary stops two and one-half times as many failures per train mile due to defects in the apparatus as the Westinghouse. The difference in emergency stops would probably have been just as great had the emergencies arisen. The Westinghouse made one and one-fourth as many delays to traffic as the automatic vacuum, but were the delays from the one cause of bursted hose connection left out the proportions would have been one for the Westinghouse to 2.4 for the automatic vacuum. These figures carry their own moral and need no comment.

The other brakes run in passenger service made one failure of the second class (that is, failures to make ordinary stops) to every 602,000 train miles, or 17.2 times as many as the Westinghouse. Most of this mileage was by stock equipped with Smith's vacuum and the simple vacuum.

Transit Orders on Wheat.

The milling-in-transit system has always been liable to abuse, and has been seriously criticised by public authorities. It has been justified as being the only available means of enabling millers at intermediate points to live. If a through rate of 30 cents is given on grain or flour from the initial point of shipment to Chicago, while the rate on grain to Minneapolis is 25 cents and on flour from Minneapolis to Chicago 10 cents, it is obvious that Minneapolis millers cannot handle grain destined for Chicago. The flour must be ground, either at the initial point of shipment or at its final destination. The former would involve too much scattering of capital, in milling ventures subject to unnecessary risks; the latter would involve a concentration of milling interests in places not naturally suited for them. The effort of the advocates of the milling-in-transit system was to put intermediate points on substantial equality with terminal points in this respect, so that milling could be done wherever the business advantages seemed greatest.

We believe that these arguments are sound. At the same time, the system is extremely open to abuse. The difficulties in carrying it out are illustrated in the present situation in the Northwest. A large part of the grain received at Minneapolis was sent there on bills of lading specifying through rates to Chicago. The charge to Minneapolis on these terms was a percentage of the through Chicago rate, instead of a full local rate, while the subsequent charge to Chicago was so adjusted as to make up the remainder of the through rate, and was, therefore, much less than the regular rate on flour. When the Duluth and the Soo lines began to carry larger quantities of freight than before, they were obliged to secure it by specially low rates, and they made these rates low enough to meet not only the regular rate from Minneapolis to Chicago, but the transit rate also. Under these circumstances the traffic was diverted from its original destination, which left outstanding transit orders in excess of the amount of flour awaiting shipment.

The effect of this was closely analogous to that of a surplus of foreign bills of exchange above the amount of goods for which they can be used in settlement. Transit orders were dealt in by brokers as a commodity, and came to command a price even lower than the rates which the railroads intended to charge on such traffic. This had all the effects of a rebate, and, as the orders were issued by particular lines, it was virtually a rebate employed to throw the traffic over those lines.

The natural remedy was to make transit orders good over all lines indiscriminately; and this has been adopted after much opposition. But the question of the redemption of such orders makes trouble. There are several distinct standards of valuation. The low-

est is their speculative value on the Minneapolis Board of Trade, which has been as low as three cents. Somewhat higher is the actual *pro rata* on a through rate which the road would actually receive. Still higher, apparently, is the redemption figure, which has been arbitrarily fixed by a recent agreement. Chicago dispatches report it at nine cents. The roads which insisted on this figure obviously meant to take away from the competing lines all inducement to issue orders for such traffic. We rather think that they have gone too far. Under the nine-cent redemption rate either the system or the agreement must go to the wall. We suspect that it will be the agreement.

Standard Rules.

At the October meeting of the Time Convention the report of the committee on standard train rules and rules for the movement of trains by telegraphic orders reported the adoption of the same by railroads representing over 50,000 miles, or nearly one-half of the active railroad mileage of the United States. It is quite probable that all, or at least most, of these companies have adopted the rules as recommended by the convention, though some have made slight changes which seemed necessary to suit their local or peculiar circumstances. In a few cases changes have been made and approved by the convention since the rules were put in effect on some lines. It is now to be hoped that the original idea of absolute uniformity will be carefully preserved by all. Undoubtedly, changes will be necessary and desirable from time to time, as experience or circumstances may dictate; but instead of each line making changes to suit its own ideas or necessities, let proper records be kept, showing weak points or objections to existing rules, and then ask the standard rule committee to take the matter up and bring it before the convention. There it can be discussed and acted upon as its merits or demerits may demand. In this manner all changes become legalized, so to speak, and will be more readily accepted by all. The same suggestion would apply to any additional rule, or rules, which may be necessary at any future time.

There certainly is no disposition among the roads which have adopted the code to continue rules which can be shown to be improper or that are inefficient, and all companies interested in securing the best service should join in perfecting and maintaining the uniform rules. The great importance of this question would certainly justify careful consideration and representation at every meeting of the convention by each company. It will require but little effort on the part of each to accomplish this very desirable result, and it is to be hoped the matter will not be overlooked or forgotten.

The above has been sent us by a prominent member of the Time Convention. His point has been many times made in the *Railroad Gazette*, both in the editorial columns and elsewhere, but we print the communication as evidence that the questions before the Time Convention are not dropped from the minds of all the influential members as soon as the meeting is over—as some may suppose. We fear that alterations of rules are more common, and of more consequence, among the roads that have taken up the standard code, than is implied by the moderate language of our correspondent. It is true that there is no disposition to continue poor rules; but there is, in consequence of pressure of other matters, an indisposition to discontinue them by substituting better ones. Intrusting this matter to an officer whose other duties are so numerous that he has to postpone this for a year or two amounts practically to the same thing as complete indifference; and the last point of our correspondent's argument cannot be too strongly urged. The important topics to be brought up at each meeting ought to be made the subject of a pamphlet to be circulated among the members several weeks before the date of gathering. Representation at every convention by all the roads, or even by a quarter of them, implies intelligent and profitable discussion, but this cannot be accomplished with the best effect unless the subjects for discussion shall have been digested by those who are interested in them. A committee report presented 24 hours before the meeting is not properly effective. The advance circulation of carefully prepared papers, after the manner of the engineering societies, would be an excellent idea. The characteristic brevity and terseness of transportation officers' communications should preclude any fear that this would make the meetings too long.

A Railroad Library.

The Prussian Department of Public Works has now for its chief duty the working of the Prussian state railroads, which include about 14,000 miles of road, but this is not by any means its sole work. As its name indicates, it conducts all the public works of the kingdom, and these are very numerous, including a large part of the highways, the canal and river improvements, the working of the government mines and the construction and maintenance of a very large number of public buildings, so that what we may call the architect's division of the department has probably more building operations to conduct than any other one body, except perhaps the similar organization in France.

Naturally, a considerable library is indispensable to such an administration, and a considerable one it has. The catalogue of this library lies before us, in two vol-

umes, the first containing the works on hand in 1882, and the second nearly as large, the acquisitions from that time down to November, 1888. It is impossible to tell from the catalogue the number of volumes. The works are numbered by departments, and there are many departments, and in a few cases there is more than one work under a single number. But the chief difficulty is with the number of volumes in each work. For instance, No. 938 in the department "Railroads" (*Eisenbahnwesen*) includes the *Railroad Gazette*—all the volumes in the library—and No. 94 the *Journal of the German Railroad Union*, including the issues for 46 years, which make about 60 state volumes. (The files since 1872 occupy a very considerable space in the *Railroad Gazette's* library.) Then there are long series of reports of judicial and administrative decisions—the latter as indispensable in a well-conducted public administration as the reports of decisions of our courts are to our lawyers and judges. So encyclopædic works are given under a single number, and also such documents as the British Board of Trade reports, our railroad commission reports, Poor's Manual, etc. The number of yearly volumes classed as railroad periodicals appears to be 376; and such publications as *Engineering*, *The Engineer*, the *Transactions of the American Society of Civil Engineers* and the *Proceedings of the Institute of Civil Engineers* naturally come under another classification. It therefore gives a very inadequate idea of this library to say that a footing of the numbers indicates that it has 4,905 titles, of which 1,502 are in the department of "Railroads."

It is interesting to see that the library is largely the creation of recent years; for the catalogue of 1882 had only 3,163 titles, the other 1,742 having been acquired in the following six years. The proportion holds in the works relating to railroads, 558 of which were added since 1882, and this, be it remembered, not including the new volumes of any periodicals of which the library had any volume in 1882. Thus the average yearly growth was at the rate of 93 works per year; and as the department receives 35 railroad periodicals, there is an average of about 2½ volumes per week for the industrial railroad student. Of the railroad periodicals received in 1888 (several being annuals), 20 were German, 5 French, 5 American (including Poor's Manual and the Master Car-Builders' Reports), 3 Italian, 1 English and 1 Russian. Of our railroad commission reports, there were acquired after 1882, one for Illinois, one for New York, one for Michigan and the United States (Pacific railroads) Commissioners' Report for two years. As in these six years about 125 state railroad reports were published in the United States, it would seem that the Prussian Ministry has made very moderate use of this source of information—having about five volumes out of the whole number. The library has more numerous copies of state reports issued previous to 1882; but the Ministry's appetite seems to have been satisfied, in most cases, with a single report for a state.

However, aside from journals and reports, America contributes very little to the railroad department of this library. It is true it could not contribute much, but the best and best known of our railroad books are conspicuous by their absence. We do not find the titles of Forney's "Catechism of the Locomotive," of any of Mr. Fink's pamphlets, Paine's "Elements of Railroad Engineering," the "Car-Builders' Dictionary," the "Roadmasters' Assistant," or Wellington's "Location of Railways." Indeed, Hadley's "Railroad Transportation," "Recent Locomotives," Adams' "Railroad Accidents," Kirkman's "Baggage, Parcel and Mail Traffic," some railroad law books and one little pamphlet each by Chanute, Blanchard, Pierson and Vining seem to be the only American railroad "books," in the ordinary use of the term; that is, excluding reports and periodicals.

The railroad library is divided into several sub-departments. Under the head of "general" are 63 manuals and general treatises, some of them, like the great French work of Couche, in three quarto volumes, and Kaven's German "Lectures on Railroad Construction," are almost encyclopædic. There are 41 titles under the head of "Construction and Rolling Stock," including Winkler's three large volumes on "Superstructure," "Switches and Crossings" and "Turntables;" Hensinger von Waldegg's five great volumes on "Railroad Construction," "Car Construction," "Locomotive Construction," "Operation, Signals and Shops" and "Construction and Working of Secondary and Tertiary Railroads," including "Cable Railroads." "Location and Superstructure" shows 55 titles, "Tunnel Construction," 23; "Structures," 46; "Rolling Stock," 50; "Administration Accounts, etc.," 227; "Railroad Rates," 110; "Telegraphs and Signals," 24; "Construction and Working of Secondary or Mountain Railroads, or other Exceptional Systems," 91; "Railroad Law," 153; "Railroad Statistics," 304.

It must be remembered that the other departments of this library contain many works indispensable to the railroad man, and especially to the railroad engineer. There are 808 titles in the "Bauwesen" (construction) department, which includes architecture, cements and masonry, the whole title "engineering" being a sub-department under "Bauwesen." It appears to be as difficult to know what engineering means in Germany as in this country. We should judge from the titles that a work must be highly mathematical to be admitted into this subdivision of "Ingenieurwesen"; some of them seem to be purely astronomical. "Earthworks and Highways" is a subdivision under "Construction" (Bauwesen), and "Bridge Construction" comes here, while

"Tunnel Construction" comes in the Railroad Department. The American works on bridges are Roebing's Report on the Niagara Suspension Bridge, Smith's Analysis of the Fink, Murphy, Bullman and Triangular Trusses, Bender's Proportions of Pins used in Bridges, and Greene's Report on the Wreck of the Ashtabula Bridge—a woefully inadequate representation of the greatest bridge-building country of the world.

The catalogue also covers two small special libraries, one belonging to the Mining Department of the Ministry and one to the Construction Department, and these include a few railroad books.

This library doubtless has more railroad books than any other in the world, and though it is not complete it doubtless contains most of the works which would be of use to a railroad man in Germany. We wish we could point to something in our country remotely resembling it in completeness. Unfortunately the number of English railroad books is small, and so few of our practical railroad men read German and French that if we had such a library it would probably be little used, or rather would not be used by a great many people. It is, however, a mistake to suppose that the number of persons benefited by such a library is limited to the number of those who use it. What one learns is communicated directly or indirectly to his fellows if it has practical value, and there are enough men who would be readers of such a library, if they had access to one, to absorb and diffuse a great deal of valuable information from it; enough, doubtless, when applied on our 150,000 miles of railroad, even to the limited extent it would be applied, to pay for the whole cost of the library many times over yearly, and probably several of our larger railroad companies have men who could, and would, use such a library enough to make the acquisition of one for their general offices a profitable investment. Every collection of this kind must contain a great deal of trash, but a practical man is not likely to waste much time over that.

On Nov. 5 the subscriptions to the guarantee fund for the World's Fair in New York amounted to \$2,401,330, having only increased \$787,718 in the six days following our last report (see *Railroad Gazette*, Nov. 1). The Committee on Site and Buildings announce a meeting in a few days, at which time they may possibly recede from their determination to occupy Central Park, and as they have little else to fall back upon, the project for the Fair will probably die gracefully. If they abandon Central Park their action will doubtless be a forced one. Some days before the general election in New York state the *Evening Post* interviewed city candidates for the Legislature as to their views concerning the repeal of the law forbidding the use of Central Park for anything but its present purposes. Of 17 candidates for the Senate 13 pronounced against the repeal, while four were either in favor of it or non-committal; and of 57 nominees for the Assembly 39 were opposed to the repeal, and 18 were in favor of it or non-committal. As a result of the election, it appears that only one of the seven senators-elect and five of the 24 assemblymen are in favor of a repeal; so that if the Committee on Site and Buildings persist in their purpose to include Central Park in the site, they will probably have their labor for their pains.

It is a significant fact that of the daily papers formerly in favor of using Central Park, all but the *Sun* now oppose the idea, showing that popular sentiment is by no means to be despised. The *Morning Journal* has addressed communications to the 330 members of the next Congress, asking their preferences as to the location of the Fair, and has received replies from 140, as follows:

For Chicago	40
" New York	33
" Washington	13
" St. Louis	8
" Chattanooga	1
Non-committal	45
	140

The St. Louis Committee have established a literary bureau at Washington, in emulation of that started by Chicago; and the idea which has been advanced, that New York should sell out to an English syndicate, does not seem altogether extravagant, in view of the total lack of management displayed by the present organizers.

Since the meeting of the Time Convention the following named gentlemen have been appointed to represent their respective companies on the committees: On *Car Service* Committee—New York Central & Hudson River, Theodore Voorhees, assistant general superintendent; East Tennessee, Virginia & Georgia, C. H. Hudson, general manager; New York & New England, A. A. Jackson, general superintendent; Chicago, Rock Island & Pacific, H. F. Royce, general superintendent lines east of Missouri River; Pennsylvania, S. M. Prevost, general superintendent transportation; Lake Shore & Michigan Southern, J. E. Childs, assistant general manager; Chicago, Burlington & Northern, John J. Merrill, car accountant; Northern Pacific, T. J. Delamere, superintendent transportation; one vacancy. Committee on *Safety Appliances*—Richmond, Fredericksburg & Potomac, E. T. D. Myers, general superintendent; Fitchburg, John Adams, general superintendent; Delaware & Hudson Canal Co., C. D. Hammond, superintendent Northern Railway Department; Philadelphia, Wilmington & Baltimore, Theo. N. Ely, general superintendent motive

power; Chicago & Northwestern, J. M. Whitman, general manager; Baltimore & Ohio, Trans-Ohio Division, J. T. Odell, general manager; Union Pacific, E. Dickinson, assistant general manager; Louisville & Nashville, J. E. Metcalfe, general manager; Southern Pacific Co., Pacific System, J. A. Fillmore, general superintendent. Under the rules of the Convention the gentlemen named become individually members of the committees, and remain so as long as they are connected with companies that are members of the Convention.

It appears that the resolution of the Convention will not have the effect of keeping the committee membership in the company originally selected, after all. A road will escape being represented by a subordinate officer who might have secured a place by personal popularity, but in the event of its representative leaving and going to another road, it loses its representation entirely.

Surely the best equipped railroads need better devices for preventing the loss of fuel through the smokestack, and two or three of the largest roads are lacking even in the ordinary devices which reduce such losses. There is considerable excuse for not using much of the apparatus known under the name of "smoke consumers," and the use of some of them would indeed be bad policy; but there is little defense to be made for not utilizing those well-known ordinary preventives to spark throwing which are generally used on the best roads in the United States. If any one will make a series of observations of the departure of the fast express and suburban trains from the Chicago station of one of the largest Western railroads, he will notice that the air in the vicinity of the locomotive is filled with sparks to an extent that rivals the old days of wood burners. The locomotives on the line referred to are noted for their pyrotechnic displays, and their reputation is old and well established. It is strange that a railroad company can go on using devices for combustion that a large percentage of the railroads in the United States have long since discarded!

A private letter from Mr. F. W. Webb, Locomotive Superintendent of the London & Northwestern Railway, states that the two new 7-ft. driver express, compound passenger locomotives recently turned out at Crewe are doing excellent service, and have been running an average of 300 miles per day with two sets of enginesmen.

NEW PUBLICATIONS.

The two papers in the November issue of the *Journal of the Franklin Institute* of greatest interest to our readers will probably be one by Mr. E. A. Gieseler on the Aneroid Barometer, and one by Mr. C. H. Lindenberg on New Graphical Methods of Obtaining Pier Moments. In addition to these are papers on electricity, photography and meteorology, besides the usual list of notes.

The great work on Metallurgy of Steel, by Mr. Henry M. Howe, which has been running for many months in the *Engineering and Mining Journal*, is now completed. It will shortly be brought out in book form, with corrections and additions. This is probably the fullest and most authoritative work on the subject which has yet been published.

The *Memoirs of the French Society of Civil Engineers*, for the month of August, just received, contains a long account of the visit of the American engineers to Paris. Sixty-three pages are devoted to this account, which gives abstracts of many of the speeches made at the various meetings and banquets, including the bravos and other expressions of applause. The accounts of the visits to various shops and other places of interest contain brief descriptions of those places.

TRADE CATALOGUES.

The Lansing Wheelbarrow Co., of Lansing, Mich., has issued a catalogue of barrows and railroad warehouse trucks. It is a pamphlet of 23 pages, with illustrations showing each different kind of truck and barrow ready for use. This company manufactures a patent steel wheel for light trucks which has light spokes made of rods always in tension similar to the ordinary bicycle wheel. The trucks for railroad station work are made in eleven different sizes. The barrows are made of pressed steel with only one joint.

The Timlin-Heidinger Car Heater & Illuminator Co., Lebanon, Ill., has issued a new circular describing improvements in its steam-heating apparatus. The new apparatus heats by direct steam, independent steam heat, direct hot water, or independent hot-water heater. Accompanying the circular is a set of testimonials from five different railroads and the Pullman Palace Car Co.

The Sprague Electric Motor Company has issued a small circular entitled "Facts as to the Sprague Motors." This little pamphlet contains an interesting set of illustrations, showing the different purposes for which electric motors can be used. It also shows separately the different parts which comprise a motor, and gives a series of complimentary letters from purchasers.

TECHNICAL.

Locomotive Building.

The Chicago & Northwestern will soon let the contract for building 20 locomotives.

The Brooks Locomotive Works, of Dunkirk, N. Y., has completed four large freight engines for the Lake Shore & Michigan Southern.

The Louisville, New Albany & Chicago has just received two of the consolidation engines recently ordered for the New Albany Division.

The Toledo, Ann Arbor & North Michigan road has five new engines under contract, which are nearly completed, and will probably be delivered this month.

The Fort Wayne, Cincinnati & Louisville has ordered two freight engines of the Baldwin Locomotive Works.

Car Notes.

The Chicago & Northwestern has let 1,000 cars to the Peninsular Car Co., of Detroit. This company will soon ask bids for 12 passenger coaches.

The Hutchins Refrigerator Car Co., of Detroit, is asking bids for 200 refrigerator cars for the use of the California Fruit Transportation Co.

The Grand Trunk is building 1,000 freight cars at its works at Point St. Charles, Que., and has 500 under contract with James Cresson, of Coburg, Ont.

The Terre Haute Car and Manufacturing Co. has commenced work on 100 stock cars which it is to build for the Cleveland, Cincinnati, Chicago & St. Louis. The cars will be 34 ft. long and equipped with air brakes and automatic couplers.

The St. Charles Car Co., of St. Charles, Mo., has delivered this week the first installment of the 200 cars building for the St. Louis & San Francisco.

The Wagner Car Co. has completed, at its East Buffalo shops, the first of eight new sleeping cars, to be run on the Southwestern limited between Boston & St. Louis.

The Wrightsville & Tennille has received 20 new platform cars and other new rolling stock.

Bridge Notes.

It is proposed to erect a new bridge over the rapids at Ogdensburg, N. Y. The board of supervisors will have charge of the work.

The Wrought Iron Bridge Co., of Canton, O., has been awarded a contract to erect a bridge over the Herring Run, near Taylor's Church, Md.

The work of rebuilding and repairing the railroad bridges between Williamsport and Sanbury, Pa., damaged in the June flood, is progressing rapidly. Four spans of the Philadelphia & Erie bridge at Montgomery are completed, and there are four yet to build. One span of the Philadelphia & Reading bridge at Milton has been completed and five piers of the abutments are yet to be finished. One pier of this company's bridge at Muncey has been finished and four of the piers are to be extended for double track.

An iron bridge is to be erected at Glen Falls, N. Y., at an estimated cost of \$9,000.

J. W. Buchanan has the contract for the bridges on 80 miles of the Morris & Brandon branch of the Northern Pacific & Manitoba. The only heavy work will be at the crossing of the Souris River, where the span will be a very wide one.

The City Engineer has prepared plans for an iron bridge to be erected on Merrimack street, Lowell, Mass.

The Denver & Rio Grande has just completed an iron viaduct across the Cascade cañon, near Osier, Col., on the fourth division. It is 129 ft. high and 410 ft. long, of seven sets of 54 ft. and one set of 32 ft. iron girders, resting on iron columns at either ends.

Proposals are wanted until Nov. 27 for building an iron bridge, with tubular pier spans, across the Blue River at Westmoreland, Kan.

The bids for erecting an iron bridge at Danville were all rejected by the city engineer.

It is proposed to build a combined railroad and passenger bridge across the Ottawa River at Ottawa at a cost of \$275,000. A city election will shortly be held to decide the question. The city of Ottawa has been asked to subscribe \$100,000, and the Dominion and provincial governments will also be asked to grant a subsidy. The bridge will span the Ottawa River between Rockliff and Gatineau Point.

Bids were opened Oct. 30 for the superstructure of the steel arch bridge at Minneapolis. First figures, oak floor; second figures, iron. The following were the bids: Massillon Bridge Co., \$59,330; \$69,941. Chicago Bridge Co., \$64,994; \$72,994. Smith Bridge Co., Toledo, \$69,875; \$73,500. Milwaukee Bridge Co., \$69,750; \$78,705. King Bridge Co., Cleveland, \$61,999; \$74,800. Shifter Bridge Co., Pittsburgh, \$69,400; \$78,300. Wrought Iron Bridge Co., Canton, O., \$65,422; \$72,881. Mt. Vernon Bridge Co., \$59,988; \$67,893. Keystone Bridge Co., Pittsburgh, \$74,900; \$83,900.—*Engineering and Building Record*.

Manufacturing and Business.

The directors of the Southwark Foundry & Machine Co., of Philadelphia, have authorized the increase of the capital stock from \$250,000 to \$300,000. The additional \$50,000 will be used in building a new erecting shop.

The Standard Tiffany Refrigerator Car Co., of Chicago, was incorporated in Illinois last week, to build and operate refrigerator cars and warehouses. The capital stock is \$100,000. The incorporators are Charles F. Pierce, Theodore Huston and George W. Henry.

A new wood-working plant costing about \$5,000 has been put into operation in the South Baltimore Car Co.'s works, at Baltimore, Md. The output of the works is now increased to 15 freight cars per day.

The City Council of St. John, New Brunswick, has decided to purchase a dredge for use in that harbor, to have a capacity of 500 tons of material per day and capable of working in 60 ft. of water. The City Council will also purchase a diamond drill for use in the harbor.

Mr. W. H. Inloe, of Asheville, N. C., received honorable mention for his model of patent turntable lock at the Paris Exposition.

There has recently been located at Elwood, a station on the Chicago, St. Louis & Pittsburgh, between Richmond and Logansport, Ind., one of the largest plate-glass works in the United States. The buildings are to be handsome, of brick and stone, and to cover 14 acres of ground. Elwood promises to become an important manufacturing town. Factories are locating there and the town is growing rapidly, over 100 dwelling houses having been put up this summer.

The Dunham Manufacturing Co. has received a large

trial order from the Boston & Maine for the combination of the Davies steel lock spike and Servis tie plate.

The car wheel works at New Decatur, Ala., are turning out 60 car wheels daily. The company has contracted with the Louisville & Nashville to supply that road with all wheels needed on the system south of Nashville, Tenn., and it is also supplying the United States Rolling Stock Co. with wheels.

One of the greatest manufacturers of wheelbarrows, warehouse trucks, hand-cars and the like, is the Lansing Wheelbarrow Co., of Lansing, Mich. The company expects this year to make over 50,000 wheelbarrows. The company ships its barrows and trucks to South America and Australia, and has recently furnished an order for 5,000 barrows to be used on the Nicaragua Canal. The average shipments are said to be three carloads per day. The company makes a baggage truck of improved construction. The main wheels are large and carry most of the load, while the front wheels are so arranged that the truck will turn easily in its own length.

The Industrial Works of Bay City, Mich., recently shipped a standard extension pile-driver to the Chicago & Atlantic, and another to the Mexican Central road; also a newly designed 35-ton wrecking and construction crane to the Kansas City, Ft. Scott & Memphis. This crane has a steel car mounted upon three heavy trucks, a powerful engine, boiler, hoisting machinery and ponderous steel jib. Among other contracts upon which the company is at present engaged are the following: An electric transfer table, 60 ft. long, and of the largest capacity, for the new shops of the Union Pacific road at Cheyenne, Wyo.; two 20-ton steel transfer cranes and one 20-ton steel pillar crane for the Detroit yards of the Michigan Central; a 15-ton steel pillar crane for the Cincinnati, Hamilton & Dayton, and also a portable steel rail cutting-off saw for the Canadian Pacific, which will include, in addition to the cold saw proper, a double cylinder high-speed driving engine, rail drill, feed tables, and all the parts necessary for a complete equipment for this work.

In addition to these, there is about completed an extension pile-driver for the Duluth & Iron Range road, and a 30-ton steam wrecking and construction crane for the Savannah, Florida & Western, and a turntable for the shops of the Toledo, Ann Arbor & North Michigan road at Clare, Mich. A recent order has been received from the Cambria Iron Works, of Johnstown, Pa., for a portable steel crane and car of 15 tons capacity. The company has other extensive orders, not yet placed in the shops, that will keep the works busy for several months.

Iron and Steel.

The Geo. P. Whitaker Co. has let the contract for the erection of a blast furnace at Principio, Md., to Gordon, Strobel & Laureau, Philadelphia, Pa.

The roof of the new hot blast of the Girard Furnace, at Girard, O., fell in recently while a number of workmen were engaged upon it. The men were badly burned by escaping steam.

An iron company will, next spring, erect an anthracite furnace at Pine Grove, Cumberland County, Pa. The furnace will be under the management of Col. J. C. Fuller. Its capacity will be from 150 to 200 tons of iron daily.

Stack No. 1 of the Reading Iron Company's furnaces was lighted last week. The furnace has a capacity of from 550 to 600 tons a week. Stack No. 2 of the same company will be ready to in put blast in about three weeks.

The Lancaster Iron Co., recently chartered in Pennsylvania, has purchased the plant of the Middlesex Rolling Mill, at West Middlesex, Pa. The plant is being removed to Lancaster, O., and is being rebuilt with additions and improvements. When completed the plant will have 24 single puddling furnaces, a 16-in. bar mill, a 10-in. and a 7-in. guide mill and five heating furnaces. Natural gas is used in the furnaces. The plant will employ 100 men. Officers: Lloyd Booth, President; J. W. Friend, Vice-President; Ralph J. Wick, Treasurer and General Manager, and G. B. Motheral, Secretary.

In the *Railroad Gazette* of last week the statement was made that the Wheeler Iron Co. had purchased the furnace of the Henderson Iron Co., at Sharpsburg, Pa. This property is situated at Sharpsville, Mercer County, Pa. The furnace will be known as the "Alice." The furnaces at Sharpsville are the "Alice," one stack; the "Claine," one stack; the "Sharpsville," one stack; the "Douglas," two stacks; the "Spearman," two stacks; the "Mabel," two stacks; five stacks now in blast, making an aggregate of about 500 tons of metal per diem. The "Alice" will soon go in. As refitted she will make 100 tons per diem. The property in question will be operated by a company yet to be organized. It will probably be styled "The Wheeler Furnace Co."

The Rail Market.

Steel Rails.—The market is firm and quiet. There is a lessened demand, but the mills are busy. The quotations are: \$31.50@32.50 at New York, \$35 at Chicago and \$33@33.50 for heavy sections at Pittsburgh mills. It is asserted by some buyers that the quotations recently given out misrepresent the actual state of the market, and claim that an eastern trunk line has ordered its supply at \$29.50. It is stated on good authority that the allotment for next year is 1,000,000 tons.

Old Rails.—The Eastern market is quiet and dull. Numerous inquiries are reported at Chicago, and at Pittsburgh the market is unsettled. Old rails are held at \$25 at New York, and at Pittsburgh a sale of 500 tons of old iron rails at \$27.50 is reported, though \$27 is the general quotation. Old steel rails are quoted at \$22@22.50 at Pittsburgh, and at \$19.50 at Chicago for mixed lengths. Holders of old iron rails at Chicago demand \$26@26.25, but buyers offer only \$25.50.

Track Fastenings.—Quotations are \$2.15@2.25 for spikes, and \$2.05@2.15 for angle bars.

Car Heating.

The Illinois Central is fitting up two engines, to run between Kankakee and Chicago, on the "Big Four" trains, with steam heating apparatus.

The Baltimore & Ohio is equipping a vestibule train with a steam heating apparatus designed by the officers of the road. Three postal cars will be fitted also with a combination steam and water circulating apparatus.

The Martin Anti-Fire Car Heater Co. has taken orders to fit up trains on the Milwaukee, Lake Shore & Western and on the Wisconsin Central.

The following roads, at a conference recently held, adopted the Gibbs coupler for steam-heating pipes: The Central of New Jersey, Philadelphia & Reading; Cincinnati, Washington & Baltimore; Ohio & Mississippi;

Baltimore & Ohio; and the Pullman Co., for cars that run over the above lines.

The Timlin-Heidinger car heater has been applied to a Pullman car at the Pullman Palace Car Co.'s Works at Pullman, Ill. The company has been experimenting with this heater for some time past under the various conditions obtainable at the works. This heater has this season some new features which render it possible to work it by direct steam, independent steam heat, direct hot water or independent hot water systems. The latest addition is a steam drum, by means of which the hot water system is operated by steam direct from the locomotive.

New Shops and Stations.

The Canadian Pacific has a large gang of men at work on its new workshops at Hochelaga, Que. The foundry will be 183 x 114 ft. and one story high; the wood and car shop, two stories high, 140 x 80 ft., and the machine shops 100 x 80 ft., one story high. When the shops are completed the company expects to manufacture most of the rolling stock the road will require.

The Memphis & Charleston will soon award the contracts for grading the site and constructing the machine shops for that road at Sheffield, Ala. The Sheffield Machine Co. has been formed to build the shops.

The Louisville, St. Louis & Texas has awarded the contract for building the machine shops at Cloverport to Bailey & Koerner, of Henderson, Ky., for \$20,000. There were five bidders.

The roundhouse and machine and repair shops of the Pittsburgh & Castle Shannon road, at Castle Shannon, Pa., were burned last week, causing a loss of \$50,000, partly insured.

The building of the new freight dock and sheds for the Baltimore & Ohio at St. George, Staten Island, was begun last week.

Tenders are asked for building the station at Windsor, Ont., for the Canadian Pacific. It will be of Gothic architecture and located on the river front, and will be built of brick and stone and cost about \$16,000. The Canadian Pacific will also commence work at once on a station at North Bay, to cost about \$9,000.

Black's Automatic Block Signal.

This signal, which has been in use for two years on the Manhattan Elevated, the Kings County Elevated and the Staten Island rapid transit roads, and has been heretofore mentioned in these columns, is a device by which a train sets and clears signals in its rear by mechanical connection. It has been worked with considerable success on blocks of moderate length, and a large number of blocks are now protected by it on the Manhattan. The apparatus is very simple, and appears to have given good satisfaction. It is made by the Black Automatic Railway Block Signal Co., 18 West Fourteenth street, New York City. Mr. T. G. Palmer is the General Manager of the company.

Mr. Palmer has also a removable switch point, which consists of a short piece of steel carefully fitted to the point of the switch rail, the purpose being to remove this point and replace it by a new one when it is worn, and thus prevent the necessity for taking out the entire switch rail because of a worn or damaged point. It is said that the point can be replaced for half the cost of a switch rail. Mr. Palmer thus estimates "a saving of 100 per cent.," which is another instance of a mistaken use of percentages.

Length of Trains in Europe.

The great length of trains in England, in proportion to the number of passengers, has given rise to several attempts to reduce the distance between cars. Mr. Stroudley, Locomotive and Car Superintendent of the London, Brighton & South Coast, has given this matter much attention, and by a new arrangement of coupling devices and spring buffers he has been enabled to reduce the distance between the cars to about 10 in., while in ordinary English practice the distance is about 2 ft. 9 in. In some cases the distance is only about 2 ft. On the London, Brighton & South Coast, trains of from 12 to 15 cars are made up solid and seldom uncoupled. Sheds are arranged of great length in order that the trains may be taken in entire. In Germany and France the distance between cars is even greater than in England, and the waste of space in a train of ordinary dimensions is something enormous.

Steam Shovels and Dredges.

The Northern Pacific Railroad has given an order to the Bucyrus Mfg. Co., of Bucyrus, O., for five steam shovels. This is said to be the largest single order ever given by a railroad company for steam shovels, and makes 11 steam shovels that this railroad will have in use on their road.

The elevator or endless chain dredge, built by the Bucyrus Mfg. Co. for the government work on the Calumet River, Chicago, one day last week handled 4,665 yards, cross section measurement, in seven hours, which is equal to over 6,000 yards on the bank.

The Fowler Steel Wheel.

On Tuesday last the Fowler Steel Wheel Co., of Chicago, had in operation its new furnace, which operates on the Robert process, for making cast steel for car wheels. Several castings were satisfactorily made, and with the exception of the facilities for handling the material the apparatus is in good working order. Improvements are being made daily, and all of the machinery is being put in condition for regular business. The shops are located near Burnside, on the Illinois Central Railroad, not far from the Nickel Plate shops. Several large buildings contain the machinery for rolling the wheels, the furnaces for heating, pits for annealing, blowing engines, stationary boilers, cupola, converter, and the few machine tools. The men in charge of the work are gradually becoming used to the new process, and each succeeding blast is better than the previous one. The firm is now in the market for orders, and has laid out the plant for a capacity of 200 wheels per week.

The Forth Bridge.

A London dispatch of the 6th inst. reports that the Forth Bridge is completed. The first connecting span was successfully closed some weeks ago. This dispatch probably means that the second has been closed, and not that the floor system is finished.

Steel Ceilings for Cars.

W. A. Kinner & Co., of Columbus, Ohio, have issued a catalogue showing the sheet steel ceilings of their manufacture. These ceilings are being used on trial in a few passenger coaches. They are made of sheet steel pickled and cold rolled, then stamped in dies, thus forming almost any desired shape, molding or decoration, free from buckles and of uniform dimensions.

The Louisville and Jeffersonville Bridge.

The following note supplements the information which we gave last week concerning this work. The bridge is to consist of six spans, as follows: beginning on the Indiana side, one of 210 ft.; three of 550 ft. each and two of 342 ft. 6 in. each. The three large spans rest on masonry piers, the foundation of which (except in the case of pier 2, where the bed rock is at low water) are on pneumatic foundations. The deepest of these goes to a depth of nearly 80 ft. below low water. Work has been begun on all of the piers except the two in the channel. The construction of all the piers will be vigorously pushed. The caissons for the two channel piers will be framed during the high water season and work on the other piers will progress continuously until they are finished.

Kirwan's Station Indicator.

The Central of New Jersey is trying Dr. George H. Kirwan's electric station indicator on two of its trains between Jersey City and Wilkesbarre. There is a scroll in the front of each car containing the names of the stations in plain black letters, and these are regulated by the baggagemaster, who, by pressing an electric button in the baggage car, changes the name after leaving each station. An electric bell attracts the attention of the passengers to the signs. This instrument was described in the *Railroad Gazette* of April 12.

The U. S. Cruiser "Charleston."

The Secretary of the Navy has notified the Union Iron Co., of San Francisco, that he is ready to accept the protected cruiser "Charleston" at the contract price of \$1,017,000, deducting \$4,500 for delay in completion, and \$23,000 for failure to develop the horse power required by contract. The builders have asked permission to substitute screws of a finer pitch and make another trial, but have been informed that if they do this they must pay a penalty of \$100 a day until the vessel is accepted; and it is probable that the cruiser will be delivered to the Navy Department as originally proposed. While the proposed change of screws would doubtless produce a higher indicated horse power, it would render the vessel less efficient in service, according to the views of many naval officers.

Bids for Steel.

On Oct. 31 bids for steel to be used in the construction of United States cruisers Nos. 7 and 8 were opened at Washington. The following are the figures:

Class	Quantity, tons.	Quality.	Bid.		Bidder.
			Total.	Per ton.	
A....	672	Thin plates.	\$71,500.80	\$106.40	Lind-n Steel Co., Pittsburgh.
			65,856.00	98.00	Carnegie, Phipps & Co., Limited, Pittsburgh.
B....	190	Thick plates	27,664.00	145.60	Linden Steel Co., Carnegie, Phipps & Co., Limited.
			30,856.00	162.40	Bethlehem Iron Co., S. Bethlehem.
C....	10	Wrought steel.	7,476.00	747.60	Carnegie, Phipps & Co., Limited.
D....	106	Steel shapes.	20,160.00	190.19	Oliver Iron & Steel Co., Pittsburgh.
E....	70	Rivets.	7,840.00	112.00	Standard Steel Casting Co., Thurlow, Pa.
F....	83	Castings.	31,606.40	380.78	

The prices quoted above seem quite high, in view of the present state of the steel market; but the specifications of the United States Navy Department are quite rigid, and this may serve to explain the figures.

Electric Capstans for Railroad Work.

In the year 1880 the Northern Railroad of France introduced in its yards a system of hydraulic capstans to transfer cars to and from turntables. The intermittent character of the work to be done, however, and the heavy first cost and operating expenses of this system has resulted recently in the substitution of an electric system worked by storage batteries. The innovation is due to W. A. Sartiaux, engineer-in-chief of the road. The plant was put down by the Société de Transmission de la Force par l'Electricité, and completely does away with the heavy and costly hydraulic machinery hitherto employed.

Magnolia Metal Bearings.

Robert H. Smith, Professor of Mechanics in Mason College, Birmingham, England, has made a series of mechanical tests relative to the durability, friction, and temperature of bearings made of magnolia anti-friction metal when running in bearings on journals of different diameters and lengths. In all, between three and four thousand tests were made, in which the temperature of the bearings and the friction were accurately determined. In his conclusion he states the metal to be superior either to Babbitt or gun metal for bearings. The results of the experiments show that the temperature of the bearing and friction was less, and durability of the material considerably greater, than the other materials tried. The engineers traveling abroad this summer received many inquiries regarding the special bearing metals manufactured in the United States, and there is reason to believe that the special materials for journal bearings made in the United States is in general of a finer grade than those used in Europe.

THE SCRAP HEAP.

Notes.

The Railroad Department of the Young Men's Christian Association at Hoboken, N. J., has just opened new rooms in the recently finished station of the Delaware, Lackawanna & Western.

The Chesapeake & Ohio has adopted the Giles system of time inspection. This system is also in force on the Chicago, Rock Island & Pacific west of the Missouri River, and the Giles anti-magnetic shields are used on these roads.

The new government directors of the Union Pacific are about to make their first inspection of the road. The directors are Ex-Governor R. B. Bullock, of Georgia; John E. Plummer, Jesse Spaulding, of Chicago; George E. Leighton and James W. Savage, of St. Louis. They will start from Chicago Nov. 11.

The Pennsylvania will on Nov. 10 put on a new fast express to St. Louis and Cincinnati, leaving New York

at 2 p. m. It will run through to Cincinnati in 21½ and to St. Louis in 30½ hours. The announcement says that in its equipment and schedule this train will be excelled by no other train except the Pennsylvania limited. The average time per mile will almost equal that of the limited.

The "Steam Railroad Men's Protective Union," of Boston, has complained to the Massachusetts Railroad Commission regarding the action of the Boston & Albany in running gravel trains without a conductor; of certain railroads in employing minors in their train service, and in requiring switchmen and gatemen to work 13 and 13½ hours a day without a meal hour. It was also claimed that the Boston & Maine runs certain trains with less than the legal number of brakemen.

Postmaster-General Wanamaker has issued an order fixing the rates for government telegraph service. President Green, of the Western Union, says the rates fixed are below cost, the reduction averaging about 33 per cent. from the old rate, which, he claims, was not a remunerative one. The Postmaster-General proposes the appointment of a commission to report upon the actual cost and proper value of telegraph service, their conclusions to embrace a recommendation of equitable rates for the next fiscal year.

Engineer Seth Twombly and Conductor Charles Buford were indicted at Chicago on Saturday last for the killing of the seven victims of the collision at Auburn Park. The Grand Jury did not indict either Master Mechanic Twombly or Fireman Clochs, who were held by the Coroner's jury. They believed that the Master Mechanic's responsibility for the disaster in reappointing his son engineer after he had been discharged for drunkenness was too remote to hang an indictment on, and that the fireman was a subordinate acting under orders from his engineer, which he was bound to obey, and so could not be held responsible. The engineer and conductor are held in heavy bonds.

Brotherhood of Locomotive Engineers.

Mr. P. M. Arthur has been re-elected Grand Chief for another year. The Brotherhood at its Denver meeting made a change in the organization of the Grievance Committee. Heretofore each road had its grievance committee, with a chairman. The result frequently was that the committee on one of the roads in a large system found itself unable to deal properly with the officials of the line, who were subject to higher powers and unable to treat with their employees. By the new plan the chairman of each grievance committee will also be a member of a central grievance committee, embracing the chairman of every committee in any one system of roads. This committee will possess appellate jurisdiction over the entire system. In case of the local committee of a division being unable to obtain redress from the officials, the complaint is carried to the central grievance committee, which will treat directly with the higher officers and directors.

The important results of the three weeks' session of the convention are summarized as follows: The re-election of Mr. Arthur on his platform of "strike as a last resort" and a vindication of his attitude in the "Q" strike; the increase of the insurance benefits and a large addition to the membership of the insurance branch of the Brotherhood; the settlement of serious grievances on the Vanderbilt system; the defeat of Vrooman for grand chief, but victory for his federation policy; the maintenance of grand officers' salaries to proper figures; the promotion of the ties of friendship between firemen and engineers, and the election of Cleveland (Ohio) as headquarters for the next ten years.

Grade Crossing Lawlessness.

A dispatch from Crookston, Minn., states that the fight between the St. Paul, Minneapolis & Manitoba and the Duluth, Crookston & Northern at the disputed crossing in that place was renewed Oct. 31. That was the last day for the new road to earn its bonds, and although the men made a desperate effort they were overcome by the superior numbers of the Manitoba, and were utterly routed. The fight took place about four o'clock. Previous to that time the Duluth, Crookston & Northern people, by permission of the town and county authorities, had relaid their track on the town road up to within a few feet on either side of the Manitoba track. It only needed a rail to make the connection. Ties were fastened to a couple of rails, and everything got in readiness to make the connection, but when the men picked up the piece of track and attempted to carry it across the Manitoba track the Manitoba men were ordered to charge upon them and drive them off. They were nearly all armed with pick handles, but notwithstanding this the Duluth, Crookston & Northern men fought bravely, and although greatly outnumbered held their ground for 20 minutes, and only retreated when they saw there was no room for further resistance. The Manitoba men then took the section of track and carried it back out of the way. Several men were struck with pick handles or iron bars, and about twenty were more or less injured. The sheriff was on hand with a large number of deputies, but he was powerless to act in the midst of such a mob, and wisely kept at a safe distance. The Manitoba has now undisputed possession of the crossing, and with its large force will undoubtedly be able to prevent any attempt at crossing. It is said that it only desires to prevent the Duluth, Crookston & Northern from earning the bonus, and hereafter will make no further effort to prevent the crossing.

Proposed Railroad to Labrador.

A Quebec dispatch of Nov. 5 states that "the necessary funds have already been subscribed to obtain a charter for and locate the line of a projected railroad from Levis, where the St. Lawrence will be bridged, along the north shore of the St. Lawrence to the Atlantic coast in Labrador. The scheme includes the purchase of the constructed portion of the Quebec, Montmorency & Charlevoix Railway. St. Charles Bay will probably be made the Atlantic port of the road."

We are glad to hear that the decision is in favor of St. Charles Bay. That will be a good field for subscription agents of the *Railroad Gazette* and for drummers who wish to sell summer oil to the master mechanic. If the terminus had been fixed at Fort Pettaustickopau, there would have been cause for despondency.

A Canadian Pacific Steamer Line into Chicago.

Chicago papers mention the intention of the Canadian Pacific to build a fleet of six steel freight and passenger steamers, superior to anything on the lakes, making 10 miles per hour, to run between Chicago, Milwaukee, Gladstone and Owen Sound. "A syndicate has been formed to furnish the money for the boats without other aid from the Canadian Pacific than the erection of elevators and the required terminal facilities at Owen Sound, with an agreement regarding the division of

rates, the contract covering a period of years. These terms were forwarded to President Van Horne some days ago." The fact that in a visit to Owen's Sound, made soon after, Mr. Van Horne promised the city council elevators and docks, is thought to indicate his acceptance of the proposition.

By its connection with the "Soo" road at Gladstone the steamboat line will form a line between the West and Chicago, and at the same time give a very direct route from Gladstone to Owen Sound, saving the long rail haul via Sault Ste. Marie around Georgian Bay. Communication between Chicago and Gladstone can be kept up for some time after the Straits are frozen. Mr. J. Francis Lee, the Chicago agent of the Canadian Pacific, who hopes to see a great trade built up over this route, says this additional time will amount to "a couple of months." The intention is to get a through lake and rail rate to Montreal as low as that now given to Baltimore.

The boats are to be built by Congressman F. W. Wheeler, of Bay City, Mich. American shipyards on the lakes are apparently getting about all of the shipbuilding that is not done on the Clyde for those waters; a correspondent of the New York Evening Post asserting that our yards have built about 200,000 tons of shipping, valued at \$12,000,000, during 1887 and 1888, in contrast to about \$300,000 worth built in Canadian yards during that time. It has even been proposed to build vessels on Lake Erie for trade on the Atlantic, though they would have to be cut in two to get them through the Canadian canals.

Railroads in Peru.

The Peruvian Congress has authorized the government to contract with the bondholders for the construction of a railroad connecting the Oroya line with one of the navigable rivers on the eastern side of the Andes.

As Seen by "Puck."

Salesman—Well, whatcher want?
Customer—I want to buy a hat.
Salesman—Why didn't yer say so? Move lively, now. This ain't no morgue.
Customer—I don't like to be spoken to like that.
Salesman—Yer don't? Well whatcher yer stoppin' the wheels 'f trade fer? Did yer ever see a real hat?
Customer—That's enough! Good day.
Salesman—Just wait a moment, sir. I recognized you as the ticket-seller at the Imperial Central Station, I tried to buy a ticket of you yesterday, and I've just endeavored to give you an imitation of the way you treated me. What's the size, sir?

In the Dime Museum.

Gentleman from Vermont to well-dressed freak: Say, boss, what are your strong points?
Freak—I read the Atchison re-organization scheme.
G. F. V.—B'gosh! —Pathfinder.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Lake Shore & Michigan Southern, semi-annual, 3 per cent.

Mount Washington, annual, 7 per cent., payable Nov. 20.

Pennsylvania, semi-annual, 2½ per cent., payable Nov. 30.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:
Alberta Railway & Coal Co., special, London, Eng., Dec. 2, to consider agreements entered into with other companies.

Atlantic & North Carolina, special, Newbern, N. C., Nov. 21, to consider a proposed extension.

Brooklyn, Bath & West End, annual, Brooklyn, N. Y., Nov. 14.

Buffalo, Rochester & Pittsburgh, annual, Rochester, N. Y., Nov. 18.

Central Michigan, special, Grand Rapids, Mich., Nov. 12.

Cedar & Alene Railway & Navigation Co., annual, Helena, Mont., Nov. 11.

East Tennessee, Virginia & Georgia, annual, Knoxville, Tenn., Nov. 20.

Fort Worth & Denver City, annual, Fort Worth, Tex., Dec. 10.

Georgia Pacific, annual, Birmingham, Ala., Nov. 27.

Manhattan, annual, 71 Broadway, New York City, Nov. 13.

Montgomery, Tuscaloosa & Memphis, special meeting, Montgomery, Ala., Nov. 18, to vote on a proposed increase of the capital stock.

New York, Lake Erie & Western, annual, 21 Cortlandt street, New York City, Nov. 20.

New York & Northern, annual, 32 Nassau street, New York City, Nov. 13.

New York, Pennsylvania & Ohio, annual, Cleveland, O., Nov. 9.

Southwest Pennsylvania, special, Philadelphia, Pa., Nov. 14.

Spokane Falls & Northern, annual, Spokane Falls, Wash., Nov. 11.

Tennessee Midland, annual, Memphis, Tenn., Dec. 4.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The New England Railroad Club meets at its rooms in the United States Hotel, Beach street, Boston, on the second Wednesday of each month, except June, July and August.

The Western Railway Club holds regular meetings on the third Tuesday in each month, except June, July and August, at its rooms in the Phenix Building, Jackson street, Chicago, at 2 p. m.

The New York Railroad Club meets at its rooms, 113 Liberty street, New York City, at 7:30 p. m., on the third Thursday in each month.

The Central Railway Club meets at the Tift House, Buffalo, the fourth Wednesday of January, March, May, August and October.

The Northwest Railroad Club meets on the first Saturday of each month in the St. Paul Union Station at 7:30 p. m.

The American Society of Civil Engineers holds its regular meeting on the first and third Wednesday in each month, at the House of the Society, 127 East Twenty-third street, New York.

The Boston Society of Civil Engineers holds its regular meetings at Boston, at 7:30 p. m., on the third Wednesday in each month. The next meeting will probably be held at the United States Hotel.

The Western Society of Engineers holds its regular meetings at its hall, No. 67 Washington street, Chicago, at 7:30 p. m., on the first Tuesday in each month.

The Engineers' Club of St. Louis holds regular meetings in St. Louis on the first and third Wednesdays in each month.

The Engineers' Club of Philadelphia holds regular meetings at the house of the Club, 1,122 Girard street, Philadelphia.

The Engineers' Society of Western Pennsylvania holds regular meetings on the third Tuesday in each month, at 7:30 p. m., at its rooms in the Penn Building, Pittsburgh, Pa.

The Engineers' Club of Cincinnati holds its regular meetings at the Club rooms, No. 24 West Fourth street, Cincinnati, at 8 p. m., on the fourth Thursday of each month.

The Engineers' Club of Kansas City meets at Kansas City, Mo., on the first Monday in each month.

The Civil Engineers' Society of St. Paul meets at St. Paul, Minn., on the first Monday in each month.

The Montana Society of Civil Engineers meets at Helena, Mont., at 7:30 p. m., on the third Saturday in each month.

The Civil Engineers' Club of Kansas holds regular meetings on the first Wednesday in each month at Wichita, Kan.

American Society of Civil Engineers.

A regular meeting was held at the house of the society, Nov. 6, at two o'clock, Mr. Fteley in the chair. The following were elected:

Members.—Bolton Waller De Courcy, Port Townsend, Wash.; John Quintin Jamieson, Division Engineer Oregon Railway & Navigation Co., Portland, Ore.; William Watkins Kenly, Engineer of Construction Edge Moor Bridge Works, Wilmington, Del.

Juniors.—William Frederick Behrens, Assistant Engineer Atlantic & Pacific Railroad, Albuquerque, N. M.; Morrison Clark Hamilton, Assistant Engineer in charge Asylum St. Improvement, Hartford, Conn.; George Warner Sherwood, Instructor in Civil Engineering Lehigh University, Bethlehem, Pa.

The secretary read a communication from the Institution of Civil Engineers, forwarding copies of the address of welcome to the American engineers visiting England last summer. Four copies of the address were made for the American Society of Civil Engineers, the Society of Mechanical Engineers, the Institute of Mining Engineers and the Institute of Electrical Engineers. These are beautifully illuminated with arabesque border and copies of the obverse and reverse of the Watt, Stephenson and Telford medals. The secretary of the institution took the precaution to arrange at the American consulate in London for the passage through the Custom House at New York of the package, but it was opened, the copies of the address more or less injured, and a duty of from \$800 to \$700 levied upon them.

The chairman appointed a committee to acknowledge the receipt of the address.

A communication was received from the Institute of Mining Engineers saying that the Institute had appointed a committee to arrange for the reception of the British Iron and Steel Institute in the fall of 1890, when it will hold a convention in this country. The chairman appointed on this committee Messrs. Becker, Emory and Clarke.

The Committee on Revision of the Constitution made a preliminary report. It presented a new codification of the constitution, which is simply a verbal rearrangement of the form, and makes no changes in the substance.

The committee also submitted an amendment to the amending clause of the constitution permitting changes in the constitution to be proposed and discussed at the business meeting of the summer convention. The object of these propositions is to facilitate work of constitutional revision, so that final action may possibly be taken at the annual meeting a year from next January. The committee was continued.

Mr. Emery read a paper describing a visit to the Forth Bridge. It was accompanied by diagrams showing the movements of the cantilevers under changes of temperature.

Boston Society of Civil Engineers.

A regular meeting was held Oct. 16, President Fitzgerald in the chair, 50 members and 12 visitors present. Messrs. F. W. Dean, Burton R. Felton and George I. Leland were elected members.

The secretary was directed to convey the thanks of the Society to various people who had shown courtesies to the members on the occasion of a visit to the new capitol at Albany.

Mr. Brooks made an informal report upon the appointment of a committee to confer with a committee of the American Society of Civil Engineers on the matter of affiliation of the societies. The Boston Committee had addressed to Mr. W. P. Shinn, Chairman of the Committee of the American Society, a letter saying that "if the American Society should join the Association of Engineering Societies, and thereby have a majority of the votes in the Board's management, being entitled to 13 managers, while of the 11 present managers four are members of the American Society, as is also the Secretary of the Board—in that case we believe the Boston Society would most willingly facilitate any changes in organization which might be found desirable." If this supposition is unreasonable, the committee believes that the Boston Society would accept any other plan which appeared adapted to bring about the same co-operation of the societies. The report of the committee was accepted, and its consideration assigned to the next meeting.

Personal narratives were presented by several members who visited Europe during the past summer of some of their observations and experiences. A letter from Mr. E. D. Leavitt was read, speaking of a sound solid steel casting of 50 tons weight, and others of the most intricate description which he had seen cast. He described the method of pouring large crucible steel ingots weighing as much as 85 tons. He also described the large pumping machinery at Rotterdam, and at Kladnow in Bohemia. Mr. Barrus read a paper describing the steam engineering exhibit at the Paris Exposition.

An adjourned meeting was held Oct. 30, 54 members and three visitors being present. The business was the report of the committee on revision of the constitution. Nothing final was done.

Montana Society of Civil Engineers.

A special meeting of this society was held Oct. 12, and a regular meeting Oct. 19. A committee was appointed to take action upon a communication from Mr. William P. Shinn, on the question of revision of the constitution of the American Society of Civil Engineers. This committee made a report to the effect that the Montana Society is not yet ready to commit itself on the subject

of affiliation with the American Society, but recommended the appointment of a representative to the conference to be held by the associated societies to consider especially this question. The President appointed Messrs. Haven, Herron and Keel a committee to confer with the committee of the American Society upon the question of affiliation. Mr. Haven was authorized to represent the society at the proposed meeting of the Board of Managers of the Association. The committee in its reports suggested as one of the results which should follow affiliation the establishment of a circulating engineering library.

A report was received from the committee to memorialize the Constitutional Convention of the state asking for the establishment of the office of state engineer. The Convention concluded that this matter should be left to the action of the Legislature. A report was also received from the Committee on Irrigation in Montana, covering the present condition of irrigation in that state. Also from the Committee on Public Land Surveys. This report suggested that the government appoint a regular survey bureau in each survey district, consisting, in addition to the Surveyor-General and staff, of a public surveyor and a topographer, who shall be in the regular employ of the government under salaries. The committee was authorized to draw up a memorial to Congress concerning this matter.

New England Railroad Club.

The next monthly meeting of the club will be held at the United States Hotel, Boston, Wednesday, Nov. 13, at 7:30 p. m. Subject for discussion is "Journals and Journal Bearings."

New York Railroad Club.

The first regular meeting of this club for the fall and winter season was held at its room, Oct. 21, Mr. C. E. Gary, President, in the chair. The subject discussed was "Axles, Journal Bearings, Boxes and Lubrication." The only paper presented was by Mr. George R. Meneely, which was a review of some of the experiments of recent years in journal bearing metal and a description of the Meneely roller bearing. He gave data from tests made on the Delaware & Hudson Canal Co.'s road with a train equipped with his bearings and with ordinary brass bearings. The tests were as follows:

Train No. 1 with Meneely rolling bearings:	
Weight of train	159,850 lbs.
Power to start (by dynamometer)	563 lbs.
Distance run	360 miles
Coal consumed, lump anthracite	15,600 lbs.
Water evaporated	12,081 gals.
Train No. 2, brass bearings:	
Weight of train	154,100 lbs.
Power to start (by dynamometer)	2,433 lbs.
Distance run	360 miles
Coal consumed	18,800 lbs.
Water evaporated	14,130 gals.
Summary:	
Saving in coal by No. 1	17 per cent.
Saving in water by No. 1	15 per cent.

The cost of the roller bearings is given at \$50 each. This paper was discussed principally by Mr. Lichtenhein and Mr. Meneely.

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PERSONAL.

—Mr. Hunter Gunnell, who, for some years past, has been Purchasing Agent of the Ohio, Indiana & Western road, has tendered his resignation.

—Mr. E. Buckingham, Car Accountant of the Union Pacific, has been promoted to be Superintendent of Car Service of the entire system, including the proprietary lines.

—Mr. George Crosby, Assistant Auditor of the Ohio, Indiana & Western, has been appointed Auditor of the Terre Haute & Peoria, to succeed Mr. W. M. Strange, resigned.

—Mr. William H. Baldwin, Jr., General Manager of the Montana Union, was married in Springfield, Mass., last week, to Miss Ruth Standish Bowles, daughter of the late Samuel Bowles.

—Mr. Robert Bell has been appointed Traffic Manager of the Grand Tower & Carbondale, Grand Tower & Cape Girardeau, Cape Girardeau Southwestern roads. Mr. Bell has been connected with the traffic department of various roads for 25 years.

—Mr. B. W. Thacher, Auditor of the Mexican Central, has been appointed General Freight and Passenger Agent of that road, to succeed Mr. S. H. Bass, resigned. Mr. M. M. Reynolds, has been appointed Auditor, to succeed Mr. Thacher.

—The Board of Directors of the Western Maryland last week unanimously re-elected Gen. John M. Hood as President and General Manager for the seventeenth consecutive year. Mr. John S. Barden was re-elected as Secretary and Treasurer for the seventeenth time also.

—Mr. William Buchanan, Superintendent of Motive Power and Rolling Stock of the New York Central & Hudson River road, received a gold watch and chain last week from the veteran engineers of the road. The inscription included the two dates 1849-1889, Mr. Buchanan having been with the road 40 years.

—Mr. E. L. Tyler, who was recently appointed General Superintendent of Transportation of the Georgia Central, has been appointed General Manager of the Atlanta & West Point and Western of Alabama to succeed Mr. Cecil Gabbett, who has been appointed General Manager of the Central of Georgia.

—Mr. C. V. Lewis, Assistant General Freight Agent of the Missouri Pacific at Kansas City, has resigned and will be succeeded by Mr. A. W. Street, Assistant General Freight Agent of the Toledo, St. Louis & Kansas City road. Mr. Street was formerly Assistant General Freight Agent on the Michigan Central.

—Mr. F. L. Pomeroy has been appointed General Freight Agent of the New York, Lake Erie & Western to succeed Mr. John S. Hammond, who resigned about a month ago. Mr. Pomeroy has been for some time General Eastern Agent, formerly Freight Agent of the road, and was General Freight Agent on the West Shore and the Fitchburg.

—Mr. Henry C. Wicker, who has resigned as Traffic Manager of the Chicago & Northwestern, was last week presented with a magnificent marble clock, a valuable vase and other rare household ornaments by his asso-

ciates in the traffic department of the road. The gifts were accompanied by a letter which testified to their esteem for Mr. Wicker.

—Mr. Clement B. Grubb, at one time one of the largest iron makers in Pennsylvania, and great grandson of the discoverer of the great Cornwall iron hills, died in Lancaster, Pa., Oct. 31, aged 74 years. He still retained at the time of his death an interest in Cornwall ore hills, and owned the St. Charles and Henry Clay furnaces at Columbia. He leaves a large estate.

—Mr. J. A. Monroe, General Freight Agent of the Union Pacific, has been appointed Assistant General Traffic Manager. Mr. J. S. Tibbetts, First Assistant General Freight Agent, has been appointed General Freight Agent. Other important changes in the operating and traffic departments have also been made, the jurisdiction of the general officers of the Union Pacific being extended over the branch and operative lines.

—Mr. George H. Daniels, General Passenger Agent of the New York Central & Hudson River road, is making a trip to the Pacific coast, accompanied by the General Passenger agents of the Michigan Central, Lake Shore & Michigan Southern and other Vanderbilt lines, and by the General Passenger Agent of the Boston & Albany. The party left Chicago last week in a special car, and expects to arrive in San Francisco Nov. 15. About two weeks will be spent on the Pacific coast.

—Mr. C. C. Wheeler, for many years General Freight Agent, Traffic Manager, and Assistant General Manager of the Chicago & Northwestern, and at one time General Manager of the Atchison, Topeka and Santa Fe, has opened an office in the Phenix Building, Chicago, and will undertake the examination of railroad properties, report on the value of projected lines, and give estimates of the cost of same. Mr. Wheeler examined the Wisconsin Central in the interest of the Northern Pacific previous to the latter's contract with that road.

—Mr. David A. Hopkins died of apoplexy at his home in Park Ridge, N. J., at two o'clock Thursday morning, Oct. 31, at 64 years of age. Mr. Hopkins is well known to the railroad public as the patentee and manufacturer of a lead-lined journal bearing, in which industry he had made a large fortune. He is also well known to a great number of working people for his kindness of heart and for the personal interest which he has always taken in their welfare, and for the liberality, both in money and in time, which he has shown in promoting their happiness. Mr. Hopkins had also made himself widely known to another public by his advocacy of various ideas, into which he went with enthusiasm and self-sacrifice. He had long been a liberal contributor to the cause of the Greenback party, and it was largely in the interest of the theories of that party that he supported for some years a weekly newspaper, the *American Sentry*. He will be remembered by all who knew him as a man somewhat eccentric, but of the greatest kindness of disposition and of perfect rectitude.

ELECTIONS AND APPOINTMENTS.

Astoria & South Coast.—The newly elected directors of this Oregon road have met and elected officers as follows: President, William Reid, Portland, Ore.; First Vice-President, Dr. Alfred Kinney; Second Vice-President, Mayor C. H. Page, of Astoria, Wash.; Treasurer, I. W. Case.

Atchison, Topeka & Santa Fe.—S. H. Brown, late Superintendent of Dining Cars on the Wisconsin Central, has been appointed to the same position on this road.

Atlanta & West Point.—E. L. Tyler has been appointed General Manager of this road and also of the Western of Alabama, in place of Cecil Gabbett, resigned. His headquarters will be at Montgomery.

Burlington & Missouri River.—The following changes have been made: E. Bigwell, Assistant Superintendent, will be relieved of the lines north of Aurora, the line from Aurora to Ravenna. His jurisdiction will be extended over the Alliance line from Alliance to Newcastle. V. O. English will be appointed Assistant Superintendent, with headquarters at Aurora. He will have jurisdiction over the line from Kearney to Aurora, from Aurora to Arcadia, and Arcadia to Burwell, and from Greely Center to Erierson.

G. P. Smith has been appointed Resident Engineer on the southern division, with headquarters at Wymore, Neb., to succeed Jeffries Wyman, transferred to another department.

Central of Georgia.—The offices of the Superintendent and Trainmaster of the main stem between Savannah and Atlanta have been removed from Savannah to Macon, Ga.

Central of New Jersey.—J. E. Ralph has been appointed Superintendent of the Atlantic Highlands division of this road.

Chattanooga & Virginia.—This company has been organized at Chattanooga by the following officers: John A. Hart, President; John D. Imboden, of Abingdon, Vice-President and General Manager; and Alexander W. Chambliss, of Chattanooga, Secretary and Treasurer.

Chesapeake & Ohio.—H. R. Dill has been appointed Superintendent of the Huntington division, vice M. B. Cutter, resigned, and Samuel D. Mayer, of the Peninsula division will, in addition, temporarily assume charge of the James River and Richmond divisions, vice R. H. Dill, transferred.

Chicago & Alton.—H. L. Evans has been appointed Assistant Superintendent at Chicago, with supervision over the business between Chicago and Mazon Bridge, inclusive.

Chicago, Santa Fe & California.—C. W. Kouns has been appointed Car Service Superintendent of this road and of the St. Joseph, St. Louis & Santa Fe, with headquarters at Topeka, Kan.

Chicago & State Line Terminal.—The incorporators and first Board of Directors of this Illinois company are: Charles E. Rand, Theodore Emery, John Emmitt Phillips, Joseph McH. Holmes and Charles H. Pringle, all of Chicago, Ill.

Cleveland, Cincinnati, Chicago & St. Louis.—The new directors have re-elected the following officers: M. E. Ingalls, President; J. D. Layng, Vice-President; E. F. Osborn, Secretary, and George S. Russell, Treasurer.

Cleveland, Lorain & Wheeling.—The passenger, ticket and freight business will hereafter be known as the traffic department. J. F. Townsend has been appointed Traffic Agent in charge of the department, with office in the Mercantile Bank Building, Cleveland, O.

Columbus, Hocking Valley & Toledo.—Several changes in the operating department have been announced. The office of Car Accountant has been abolished, and A. C. Ady retires. The offices of the Division Superintendents of the Ohio River and Hocking Valley divisions have been combined, and C. D. Norris, Superintendent of the former division, placed in charge. His headquarters will be at Logan. M. P. L. Booth, Superintendent of the Hocking Division, has been made Superintendent of Telegraph and Car Service Agent.

Detroit & St. Clair River.—The following are now the officers of this Michigan road: C. McElroy, President, St. Clair; L. B. Parker, Vice-President, Marine City; Martin Crocker, Secretary, Mt. Clemens; Mark Hopkins, Treasurer, St. Clair; V. A. Saph, Auditor, Marine City, and J. H. Dennis, Chief Engineer, Indianapolis, Ind.

Georgia, Carolina & Northern.—Carson Warren has been appointed Roadmaster of the First Division, with office at Chester, S. C.

Grand Rapids & Lake Michigan.—The following are the officers of this new Michigan company: W. D. Telford, of Grand Rapids, President; George P. Hummer, of Holland, Vice-President; John C. Post, of Holland, Secretary; F. A. Hall, of Grand Rapids, Treasurer, and Charles E. Temple, of Grand Rapids, Counsel.

Hanover & York.—The transfer of this road to the Pennsylvania has been completed, and the reorganized directory is as follows: President, John S. Young; Secretary, Albert Houston, of Philadelphia; Treasurer, Tabor Aston, of Philadelphia; Directors, Col. Henry D. Welsh, J. N. Dubarry, Wistar Morris, Amos R. Little, John P. Green, N. Parker Shortridge and W. A. Patton, of Philadelphia; George D. Klingfelter and Isaac Locks, of Hanover; P. H. Glafelter, of Spring Grove; Michael Schall and George P. Smyser, of York.

International & Great Northern.—Appointments have been made as follows: C. P. Matlock, Resident Engineer, vice W. E. Baker, resigned, and F. Huffsmith, Master Mechanic, with headquarters at Palestine, vice S. H. Spangler.

Kentucky Central.—L. C. Norman has been appointed Receiver of this road.

Mexican National Construction Co.—Mr. W. I. McCammon, formerly Master Mechanic of the Southern Division of the Mexican National, has accepted a similar position on the Colima Division of this company.

Missouri Pacific.—C. V. Lewis, Assistant General Freight Agent at Kansas City, having resigned, A. W. Street, Assistant General Freight Agent of the Toledo, St. Louis & Kansas City, has been appointed to succeed him, with the title of Commercial Agent.

Monterey & Mexican Gulf.—W. H. Davis, formerly with the freight department of the Nashville, Chattanooga & St. Louis, at Nashville, has been made Auditor of this road, with headquarters at Monterey, Mexico.

New Lisbon, Necedah & Lake Superior.—The directors of this new Wisconsin road are: Roswell Miller, P. W. Myers, J. W. Cary, W. R. Morrison, and E. W. McKenna, of Milwaukee; John T. Kingston and J. W. Babcock, of Necedah; and C. E. Lyman, of Minneapolis.

Northera Pacific.—J. E. Phalen has been appointed Superintendent of the Missouri Division, vice E. R. Knowlton, resigned. His headquarters will be at Dickinson, Dak.

Oregon Short Line & Utah Northern.—At a recent meeting in Boston the following directors were elected to succeed those provisionally elected: President, Charles Francis Adams; First Vice-President, William Holcomb; Second Vice-President, John Sharp; F. Gordon Dexter, F. L. Ames, Edward Atkins and Sidney Dillon.

Oregon Western.—John Kelly, William J. Muir and O. Kohler are the incorporators of this Oregon company.

Pacific, Chehalis & Eastern.—N. B. Coffman, John Dobson, D. P. Millett, Frank Donohue and William Urquhart are the resident incorporators of this new Washington company.

Pennsylvania.—The following appointments have been made: L. W. Allibone, Assistant Engineer Tyrone Division, vice McCall Mercer, transferred; J. H. Murphy, Assistant Engineer Schuylkill Division, vice R. H. Nichols, transferred.

St. Joseph & Grand Island.—The company announces the following appointments on the Leavenworth Division of the Pacific Railroad: W. William, Superintendent, with office at St. Joseph; H. O. Halstead, Assistant Superintendent, with office at Leavenworth; O. H. Andrews, Master Bridge Builder, with headquarters at Elwood, Kan.; R. A. Beck, Division Roadmaster, with headquarters at Leavenworth.

The office of Car Accountant has been abolished. All reports heretofore made to the Car Accountant at St. Joseph, Mo., should be forwarded to E. Buckingham, Superintendent of Car Service, Omaha, Neb.

St. Louis & Peoria.—At a meeting of the stockholders of the company held last week, the following directors were elected: Charles B. Taintor, of New York; Wm. Binney, Providence, R. I.; D. L. Wing, Springfield; L. H. Thomas, of Thomasville, and A. J. Morsehead, Springfield. D. L. Wing was elected President, and A. J. Morsehead, Secretary.

St. Louis & San Francisco.—E. D. Kenna, for eight years Assistant Attorney for the road, has been appointed General Attorney in charge of all litigation resulting from the operation of the road, and also of the land department. His office will be at St. Louis.

Seattle, Lake Shore & Eastern.—W. B. Blanton has been appointed Superintendent of Telegraph, with office in Seattle, Wash.

Sonora, Sinaloa & Chihuahua.—The following are the officers of this company and of the Deming, Sierra Madre & Pacific. President, George H. Sisson, Phenix Building, Chicago; Vice-President, J. A. Williamson, 45 Broadway, New York City; Secretary, Gustav Wormser, Deming, N. Mex., and Chief Engineer, Ladislao Webber, Deming.

Southern California.—The official circular announcing the appointment of Mr. K. H. Wade as General Manager of the California Southern and California Central reads as follows: "Mr. K. H. Wade is hereby appointed General Manager of the lines of this company, vice Daniel McCool, resigned. His headquarters will be at Los Angeles, Cal., and he will assume the duties of his position Nov. 1, 1889. The General Manager will have charge of the construction, maintenance and operation of the company's lines, including the movement of traffic, and will report on all matters affecting the business

under his jurisdiction to A. Manvel, Vice-President, at Chicago, Ill. GEORGE C. MAGOUN, President."

Southern Kansas of Texas.—The directors met at Fort Worth, Tex., last week and elected the following officers: A. Manvel, President, vice W. B. Strong, resigned; G. N. Kent, Auditor, vice J. A. Ostrander, resigned; C. B. Strohm, General Freight and Passenger Agent, vice J. A. Ostrander, resigned. The headquarters of the Auditor and of the General Freight and Passenger Agent will be at Panhandle, Tex.

Terre Haute & Peoria.—George Crosby has been appointed Auditor of the road, and Charles Robinson, Treasurer and Paymaster in place of Walter M. Strange and Edward A. West. Headquarters are at Decatur, Ill.

Texas Cattle Trail.—The following directors were elected at a meeting held in Albany, Tex., Oct. 29. B. M. Logan, W. H. Parvin, Stanley M. Jones, George Wolff Holstein, G. T. Reynolds, F. E. Conrad and B. B. Paddock, of Fort Worth; J. E. McCord and J. E. Coleman, of Coleman, Tex. The following officers were elected: President, G. T. Reynolds, Albany, Tex.; Vice-President, B. M. Logan, of Vernon, Tex.; Treasurer, F. E. Conrad, of Albany, Tex.; Attorney, Judge J. R. Fleming, of Albany, and Secretary, J. C. Campbell. Albany is to be the principal office.

Toledo, Ann Arbor & North Michigan.—The headquarters of the Master of Transportation, Train Dispatcher and Car Service Department have been removed from Toledo to Owasso.

Troy & New England.—The directors of this New York company are as follows: Walter P. Warren, C. W. Tillinghast, William A. Thompson, E. Murphy, Jr., H. T. Cutler, Henry H. Darling, Lewis E. Gurley, E. F. Murray, Charles E. Patterson, William Kemp, James K. Averill, Andrew J. Smart and Edgar Lynd.

Tuscaloosa Belt.—At a meeting of the directors last week, in Tuscaloosa, Ala., J. S. Rainey and J. C. Andrews, of New Orleans, and J. T. Branch, of Meridian, were added to the board, and T. B. Allen and W. C. Fitts resigned. W. H. Bofinger and N. Bowling were elected to succeed them.

Union Pacific.—The General Purchasing Agent has announced the following changes: J. H. Stafford as General Storekeeper of the entire system and proprietary lines, with office at Omaha; E. C. Conner, Tie and Timber Agent of the entire system and proprietary lines, at Omaha; J. A. Ferguson, Assistant General Storekeeper of the Missouri River Division, at Armstrong, Kan. The office of Supply Agent of the Oregon Railway & Navigation Co. has been abolished, and C. H. Gaylord has been made Assistant General Storekeeper of the Pacific Division, at Portland, Ore. The office of Purchasing Agent of the St. Joseph & Grand Island has been abolished, and E. F. Weld appointed Division Storekeeper at St. Joseph, Mo.

The following changes have been announced: J. A. Monroe, at present General Freight Agent of the company, has been promoted to the position of Assistant General Traffic Manager, with headquarters at Omaha, J. S. Tibbetts, now First Assistant General Freight Agent, succeeds Mr. Monroe as General Freight Agent.

Washington County.—The stockholders held their annual meeting at Hagerston last week. The directors elected are W. F. Burns, J. H. Fowler, Charles K. Lord, W. S. Kennedy, Edward W. Mealey, Jacob A. Miller and J. W. Stonebraker. Charles K. Lord was elected President, Mr. F. H. Hilderbrand, Secretary and Treasurer. Mr. Lord succeeds Mr. W. M. Clements as Director and President.

Western Maryland.—The directors on the present board who represent the interests of the city of Baltimore have been reappointed directors by the City Council. Col. John M. Hood has been re-elected President and General Manager, and John S. Harden, Secretary and Treasurer.

Winchester & Potomac.—The annual meeting of the stockholders was held at Winchester, Va., last week, and the following directors elected: President, W. H. Baker; W. R. Denny, W. Mayo Atkinson, W. W. Wall, Thomas W. Cover, Col. John T. Gibson, F. H. Wissler, and German Smith.

Wisconsin Central.—E. R. Knowlton has been appointed Division Superintendent of the Chicago & Milwaukee division at Chicago, to succeed Thomas Clifford, resigned.

OLD AND NEW ROADS.

Alberta Railway & Coal Co.—A special meeting will be held in London, Eng., Dec. 2, to ratify agreements with the Great Falls & Canada Railway Co., the Northwestern Coal & Navigation Co., and to authorize the issue of bonds and shares required under these agreements. The company proposes to build a road from a point near Lethbridge, Alberta, to a connection at the United States boundary with the Montana & Canada, to be built from Fort Benton.

Astoria & South Coast.—Arrangements are now completed to begin tracklaying on the section of road-bed completed from Astoria, Wash., westward about ten miles.

Baltimore & Potomac.—The company has executed a consolidated mortgage for \$10,000,000 to provide for the existing debt and additional terminal facilities. Albert Hewson, of Philadelphia, and John S. Leib, trustees, executed the release of the income mortgage, the bonds under which were held by the Pennsylvania Railroad Co. Benjamin F. Newcomer and William T. Walters, of Baltimore, are the trustees under the other two mortgages for \$3,000,000 and \$1,500,000 that are due in 1911. Six and one-half millions will be set aside to be applied by the board to provide for the payment or retirement of the existing bonds of the company as they mature or may be retired by agreement with holders. Of the residue \$1,000,000 will be applied to the extinguishment to that extent of the interest on the income bonds, and the remaining \$2,000,000 to further construction and equipment. The company has issued \$3,000,000 of the mortgage bonds at five per cent. interest to take up \$2,000,000 of six per cent. income bonds, due in 1915, and \$1,000,000 accrued interest. The release of this \$2,000,000 income mortgage has been duly executed. Of the residue \$4,500,000 will be held in reserve to retire \$3,000,000 main line and \$1,500,000 tunnel bonds, due in 1911. The \$2,500,000 will be used as the company's need may require.

Cape Breton.—The whole 98 miles of this road will be opened for traffic in July next, according to contract. The road is costing \$24,000 per mile. The terminal sta-

tions at Hawkesbury and at Sydney are to be built of stone and brick, while the intermediate stations will be of wood.

Cape Fear & Yadkin Valley.—Trains on the extension between Fayetteville and Wilmington, N. C., are now running between Wilmington and the Black River. Tracklaying has been finished some distance beyond the trestle over the Black River.

Chattanooga & Virginia.—This company has been chartered in Tennessee and will at once begin the preliminary survey from Kingston up the Clinch River valley to the Virginia coalfields to connect with the line being surveyed by the Atlantic & Danville.

Chicago & Alton.—A large gang of men were put to work last week near Bloomington, Ill., on the double tracking between Bloomington and Chicago. It is expected that it will be finished in about 60 days.

Chicago & State Line Terminal.—This company has been incorporated in Illinois to build a road from the Indiana and Illinois state line, between the south line of the town of Thornton and Lake Michigan, and run to and into the city of Chicago. The principal office is located at Chicago, and the capital stock is \$3,000,000.

Cincinnati, Bloomington & Chicago.—This company has been incorporated in Indiana. The company proposes to build a line to begin in Dearborn County and extend 300 miles northwest through Ripley, Decatur, Bartholomew, Brown, Monroe, Owen, Clay, Parke, Fountain, Warren, Benton and Jasper counties. The capital stock is \$9,000,000.

Cleveland & Canton.—The road has completed its connection with the Baltimore & Ohio and has laid its track through Zanesville, O. It has also connected at Cleveland with the Lake Shore, Michigan Southern, the Cleveland, Cincinnati, Chicago & St. Louis, the Cleveland & Pittsburgh, and the New York, Chicago & St. Louis, and will now transfer freight to and from these roads without transfer.

Cleveland, Cincinnati, Chicago & St. Louis.—The engineers who have been surveying for a proposed new line between Springfield and Columbus, O., have completed the survey, and it is said that considerable right of way has been obtained. The distance by this new line is 43½ miles, and by the Cleveland, Sandusky & Columbus, 45 miles. It is stated that the officers of the latter company have reopened negotiations with the President of the above company, looking to the purchase or lease of their line between Springfield and Columbus.

At the annual meeting in Cincinnati, O., Oct. 30, the contracts made by the directors with the Ohio, Indiana & Western, the Cairo, Vincennes & Chicago, and with the Terminal Railroad Association of St. Louis, were all approved.

The company will at once begin to double track an additional 25 miles of the main line between Cincinnati & Indianapolis.

Concord & Montreal.—The company is said to be arranging to build a track of its own at Portsmouth, N. H., to connect its main line with its wharves. The road will be a mile and a half long, and will save the company a considerable sum which it now annually pays to the Boston & Maine road for trackage.

Decatur, Chesapeake & New Orleans.—Two locating parties are now in the field surveying this road from Shelbyville north and from Fayetteville south. The line is now completed from Booneville, Tenn., south toward Fayetteville for 34 miles. The proposed line will be about 250 miles long and extend from Gallatin or Nashville to Decatur, Ala. It is claimed that the contract for building the greater part of the line will be let this winter. W. H. Calhoun, of Fayetteville, Tenn., is Chief Engineer.

Delaware & New England.—This company controls nearly all the stock of the Central New England & Western road and a large amount of the stock of the Poughkeepsie Bridge Co. It proposes to consolidate these two companies, and has offered to exchange its stock for that of the Poughkeepsie Bridge Co., share for share.

Delaware & Otsego.—Grading on this road has been completed for 22 miles from Hobart, N. Y., where it connects with the Ulster & Delaware road, northwest toward Oneonta. The remaining nine miles to complete the line to Oneonta will soon be finished. Tracklaying has been completed from Hobart to Bloomville, nine miles. A branch is being constructed from Bloomville to Delhi, eight miles. The maximum grade is 80 ft. and the maximum curvature 8 degrees. Francis Curnan, of Rhinebeck, N. Y., has the contract. Edward B. Codwise, of Kingston, is the Chief Engineer.

Denver & Rio Grande.—The company has brought suit in the United States Circuit Court, at New York, against the United States Trust Co., which was the trustee under the \$42,000,000 mortgage issued in 1886. The trust company was authorized to certify to the issue of bonds to the amount of \$6,143,000 under the mortgage, for the construction of branches, and bonds for \$4,454,000 were issued. Two branches, one 4½ miles long, and the other 2½ miles long, were constructed, and the trust company refused to allow the issue of \$136,000 in bonds to cover the cost of construction, on the ground that under the mortgage the money was to be used only for branches not less than 10 miles long. The railroad asks for an order compelling the trust company to issue the bonds.

The contracts will be let next Monday for constructing the tunnel in Tennessee Pass, seven miles from Leadville, Col. It will be 2,500 ft. in length, and on the new standard gauge line known as the Denver Short Line.

The extension from Glenwood Springs to Rifle Creek, 26 miles, which has been completed for some time, was placed in operation last week. This extension will form part of the Rio Grande Junction road, being built between Grand Junction and Glenwood Springs.

Detroit & St. Clair River.—A construction company is being formed to build this road, and the officers expect to begin construction next April. The road is to extend from St. Clair to Detroit, Mich., via Marine City, New Baltimore, Mt. Clemens and Grosse Pointe. The country is level, no hill or rock work, with easy grading and a few short curves. The maximum grade is probably 30 ft. There will be two iron swing bridges over navigable streams, with probably 50 ft. draws. C. McElroy, St. Clair, Mich., is President.

Flint & Pere Marquette.—It is stated that this company has purchased the logging road in Lake and New-Argo counties, owned by the Danaher & Melendy Co., and that it will operate it in connection with one of its branches. The road is 17 miles long and is of 3 ft. gauge.

Fort Madison, Birmingham & Western.—This company, recently organized to purchase the Fort Madison & Northwestern, bid it in at the sale in Fort Madison, Ia., last week for \$50,000.

Fort Madison & Northwestern.—This narrow-gauge line was sold at public auction by the Master in Chancery at Fort Madison, Ia., Oct. 30. The purchasers were the Fort Madison, Birmingham & Western, the price paid being \$52,000. The road will be widened to standard gauge and extended to Ottumwa, where connections with several lines will be obtained.

Gaspe.—This company proposes to build a line from the junction with the Baie des Chaleurs line at Harbor Paspebiac to deep water in Gaspe Basin, Que.

Georgetown, Silver Creek & Chicago Lake.—The right of way has been obtained for this short narrow-gauge road, which it is proposed to build from Georgetown, Col., to the mines in the southern part of Clear Creek County. It is claimed that the contract for building the road will be let before Nov. 20. W. H. Hamilton, of Georgetown, is President.

Grand Rapids & Lake Michigan.—This company has been incorporated in Michigan to build a road from Grand Rapids through Jenison and Ottawa Centre to Holland, Mich. W. D. Telford, of Grand Rapids, is President.

Hereford.—The stockholders of this company, having authorized the purchase of the road of the Dominion Lime Co., that line has been transferred to this company. It extends from a point on the Quebec Central about five miles to a point called Lime Ridge. It is expected that this road will be completed this month and turned over to the Upper Coos, which will then have a line from North Stratford, N. H., north to Cookshire, Que., about 76 miles.

Kansas City Circle.—Negotiations for contracts for the entire construction of the road are now in progress, and will probably be consummated shortly. The surveys have been made. The route is from the Missouri River, near the mouth of the Blue River, south to Brush Creek, thence generally westerly across the Kansas River south of Wyandotte and northwesterly to a point on the Missouri River at Quindaro, a distance of about 25 miles, forming a part circle around Kansas City, Mo. There will be two wrought-iron bridges about 1,000 ft. long; one wrought-iron viaduct of about 1,200 ft., and two tunnels aggregating about 1,000 ft. Wm. B. Knight, Kansas City, Mo., is Chief Engineer and General Manager.

Kansas City, Monett & Fort Smith.—This company has been voted \$40,000 at Nevada, Mo., to aid in building its proposed road from Kansas City to Monett via Nevada, the line to be completed to Nevada by July next. This new company will absorb the Kansas City, Rich Hill & Southern, and also the Kansas City, Monett & Southern, which have made surveys and obtained some right of way, but have built no road. E. L. Martin, of Kansas City, is President, and B. P. Hobart, of St. Louis, is Vice-President.

Kennebec Central.—This road, which, as noted last week, is being built from Randolph to Togus, Me., five miles, is to be of 2-ft. gauge, with a maximum grade of 185 ft. per mile. There will be no bridges. The contractor has 60 men grading. The track will be laid in the spring. The following are the prices at which the contract was let: Earth excavation, 24 cents; loose rock excavation, 60 cents; solid rock, \$1.50; clearing and grubbing, \$40 per acre; culvert masonry, \$3.50 per cubic yard; paving, \$1.75 per cubic yard, and rip-rap, 75 cents per cubic yard. Frederick Danforth, Gardiner, Me., is Chief Engineer.

Kentucky Central.—The Circuit Court at Frankfort, Ky., has appointed L. C. Norman Receiver in the suit of the state for \$50,000 and interests taxes unpaid. The road paid a part of the state's taxes, which the railroad commissioners assessed against them for 1884, 1885 and 1886, but refused to pay all on the grounds that it had an exemption clause in its charter for that amount. The Commonwealth obtained judgment in the Circuit Court last June and now seeks to enforce that judgment by the appointment of the receiver. The company operates 254 miles of road, the main line extending from Covington to Livingston, Ky.

Kentucky Midland.—Tracklaying on the section from Georgetown east to Paris, 17 miles, has been finished as far as Newtown, and will probably reach Paris by Nov. 20. This will be in time to secure the \$250,000 bonds voted by the county. The reports recently circulated that the Chesapeake & Ohio was trying to buy the line has been denied by the officers of the company, who state that no such proposition has been made.

Kingston & Pembroke.—Several of the directors of this road recently examined the route from Renfrew, Ont., to Eganville, about 20 miles, with a view to extending the line northward.

Lehigh Valley.—John Shields, of Flemington, N. J., has the contract for building the New York extension from Roselle to Lyon's Farm, N. J., four miles, and the two-mile section to Newark has been let to Broadhead & Hickey, of Scranton, Pa.

Louisville, Evansville & St. Louis.—Sixty-five-pound steel rails are being laid on the 25 miles of the Evansville Division to replace the iron rails. On the extension from Belleville to Mt. Vernon, Ill., the track is being laid at the rate of half a mile a day and the extension will probably all be completed by Jan. 1.

Louisville & Nashville.—It is stated that this company is preparing to extend the Owensboro & Nashville division from Adairville, Ky., south to Springfield, Tenn., 12 miles. This would give the Louisville & Nashville a nearly direct line from the Ohio River, at Owensboro, to Nashville, Tenn.

Work on the double track between Nashville and Edgefield Junction, Tenn., is progressing well, and will probably be ready for use by Dec. 1.

Louisville, New Albany & Chicago.—The company has commenced operating the Versailles & Midway road, under its lease of the Louisville Southern.

Macon & Birmingham.—J. S. McTigue & Co., of Memphis, Tenn., who have the contract for grading this road, are now awarding sub-contracts, and active work will begin Nov. 15. The money for building the first fifth of the line, 80 miles, is now in the company's treasury. Work on this section will be pushed through at once, and when completed bonds will be issued, indorsed by the Georgia Southern & Florida, for the rest of the line. The road will extend from Macon, Ga., to Birmingham, Ala., 230 miles, and will pass through Culloden, Thomas, Greenville, Lagrange, in Georgia, and Millinville,

Talladega, Leeds and Birmingham, in Alabama; 108 miles will be in Georgia and 122 miles in Alabama. The work is generally heavy. The maximum grade is 11 per cent. and the curves five degrees. There will be five iron bridges, aggregating 2,100 ft., and one tunnel, probably 2,000 ft. long, in Oak Mountain. W. Henry Wells, Macon, is Chief Engineer.

Marion Belt & Chingawassa Springs.—The First National Bank of Ida Grove, Ia., and others have made application to the United States Circuit Court for the appointment of a Receiver for the road. The company has become insolvent and unable to pay its debts. The property cannot be sold now except at a disadvantage, and the complainants asked that a Receiver be appointed pending a settlement of the affairs of the company, and, if necessary, that the road be appraised and sold. An injunction restraining the company from disposing of the road or any part of it pending this suit is also asked. The line was built this summer from Marion, Kan., to Chingawassa, eight miles.

Mexican Roads.—A concession has been granted for a standard gauge road from Matamoros to San Luis Potosi, where connection will be made with the Mexican Central. The new line receives a subsidy of \$8,000 per kilometre, and must be completed within 12 years. It also receives valuable land grants.

Mount Moosilauke.—The survey of this road is now in progress from a point on the Concord & Montreal to the top of Mount Moosilauke, N. H., a distance of 9½ miles. A rack and cog-wheel track will be necessary for about 1½ miles.

Nashville & Knoxville.—Grading has been completed from Buffalo Valley to Cookeville, Tenn., a distance of 21 miles, and tracklaying will be begun when the bridge at Buffalo Valley is finished, which will be in a few weeks. The contract for grading 20 miles beyond Cookeville has been awarded.

Nevada & California.—The road is now graded from Ligan, Cal., for 20 miles, ready for the rails, and tracklaying will begin when these arrive. The work on the future extensions of the road will be light. The maximum grade is 90 ft., and the sharpest curve 18 deg. The grading and tracklaying is all done by day work, no contracts being let. The road is a private property, owned by Moran Bros., New York City. The engines are all purchased at the Baldwin Locomotive Works, but the cars are built at Reno. E. Gest, Reno, Nev., is manager.

New Lisbon, Necedah & Lake Superior.—This company has been incorporated in Wisconsin by officers of the Chicago, Milwaukee & St. Paul to build an extension of that line from New Lisbon, in Juneau County, to Lake Superior, a distance of about 200 miles. The capital stock of the company is placed at \$2,000,000. It is claimed that construction will begin at once, and part of the road completed this season.

New Roads.—Messrs. Oakes, Wheaton & Co. have been awarded the contract to build the 18 miles of road between Sunny Brae and New Glasgow, Nova Scotia.

A survey of a narrow-gauge line from Watsonville to Castroville, Santa Cruz County, Cal., a distance of 12 miles, has been finished by Engineers T. W. Wright and Charles Pioda for Claus Spreckels. The line will be used for hauling beets from a ranch leased by Claus Spreckels to his factory.

The Linville Improvement Co. has commenced surveys for a road to extend from Cranberry to Linville, N. C., about 12 miles. The line will pass through a rich timber and mineral country.

Norfolk & Western.—A deed of trust from the company to the Mercantile Trust Co., of New York, for \$45,000,000 has been filed in the County Clerk's office at Roanoke, Va. The deed is to provide means to double-track portions of the line of the road and to build extensions to Ironton, Ohio; also an extension to North Carolina, and to provide additional terminal facilities at Norfolk and other improvements. Existing mortgages will be retired.

Ogden & Hot Springs.—H. W. Shurleff has the contract for grading this line from Ogden, Utah, to Hot Springs, 10 miles, and about 20 teams are at work. It is claimed that grading and tracklaying will be completed by Jan. 1. Col. A. H. Swan, of Ogden, is President.

Ohio, Indiana & Western.—Drexel, Morgan & Co., of New York, issue a circular to holders of this road's securities, in which they announce that they have undertaken to reorganize the property. The plan proposes an issue of \$10,000,000 50-year four per cent. firsts, \$4,000,000 100-year four per cent. income bonds or preferred stock, and \$10,000,000 capital stock.

Oregon & Transcontinental Co.—At a special meeting of the stockholders of the company held at Portland, Oregon, Nov. 5, resolutions were passed authorizing the directors to dissolve the company at any time before Dec. 31, 1890, by paying all its liabilities, converting or readjusting its bonded indebtedness, and distributing its assets or the proceeds thereof among the shareholders according to law; also in their discretion to sell and convey the assets to a new company or syndicate on the condition that all stockholders of the company have an equal chance to subscribe pro rata for shares in the same.

Oregon Western.—This company has filed a charter in Oregon to build a road from Portland to Aurlie, Polk County. The company also proposes to construct a bridge between Portland and East Portland, and the Oregonian Railroad, Limited, will be purchased. Steamboats on the Columbia and Willamette rivers will connect the points touched by the railroad.

Pacific, Chehalis & Eastern.—The preliminary organization of this company has been completed, but the formal incorporation is being deferred. The object is to build certain roads in Washington, among which the principal one is from Chehalis eastward 100 miles to a connection with the Northern Pacific, and westward from Pacific City on Shoalwater Bay to Chehalis. The line from Pacific City to Chehalis passes through a good agricultural and timber land. The extension from Chehalis eastward also passes through good agricultural land, and, it is stated, will reach anthracite as well as bituminous coal mines.

Pennsylvania.—The company is being urged by residents along the proposed route to construct a road from Mt. Clare, or a point on the Schuylkill Valley line to the Trappe, Limerick Square, Fruitville, Fagleyville, New Hanover, Gilertville and through Boyertown to Allentown to connect with the Lehigh Valley road.

Perry County.—This road was completed last week between New Bloomfield, Pa., and Duncannon, on the

Pennsylvania road, a distance of 11 miles. Trains are now running on regular schedule. McGovern & Co., of Tyrone, Pa., built the road.

Puget Sound & Great Eastern.—The "Puget Sound & Great Eastern Railway, Telegraph & Navigation Co." has filed articles of incorporation in Washington state. It proposes to construct a road and telegraph line from Seattle through to Spokane Falls and the Great Lakes. The capital stock is \$6,000,000, with a privilege of increasing the same to \$50,000,000.

St. Casimir & St. Alban Quarries.—This company will apply to the next Quebec Legislature for an act of incorporation to build a road from a point at or near Lacheprotiere station, in the county of Portneuf, north to St. Alban, thence west to St. Casimir and St. Ursule.

St. John River Valley.—It is stated that construction will soon commence on this road, which will open up Sunbury and Queens counties, New Brunswick.

St. Louis, Indianapolis & Eastern.—This company, whose incorporation in Illinois was noted last week, proposes to build a road from a point at or near East St. Louis easterly to the boundary line of Illinois and Indiana, at a point near the village of Palestine, a distance of 148 miles, and also a branch line from the city of Effingham to a connection with the main line at or near the city of Newton, a distance of 22 miles.

St. Louis & Peoria.—This road, which has been operated for about a month by the contractors, was formally transferred last week to the company for operation between Alhambra and Mount Olive, Ill., 14 miles. The affairs of the company are rather complicated. The road was built as an extension of the St. Louis & Chicago, but seven miles of the line yet remains to be built between Mt. Olive and Litchfield, Ill., before the two roads will be connected. The St. Louis & Chicago is now operated by a receiver, who was appointed on petition of some of the bondholders. This was opposed by other bondholders, but the receiver was appointed. The former officers of the St. Louis & Chicago are now the officers of the St. Louis & Peoria, but they have no recognized authority over the St. Louis & Chicago. A further complication will now occur, the bondholders who are at present operating the St. Louis & Chicago having made application at Springfield, Ill., for the appointment of a receiver for the above road, claiming that it is the property of the St. Louis & Chicago, under a decision of Judge Gresham, and that it has been seized by D. L. Wing without authority.

San Antonio & Aransas Pass.—Grading has been commenced between Buffalo Bayou and the San Jacinto River on the extension from Houston, Tex., toward Alexandria, La.

The extension from Luling to Lockhart, in Caldwell County, 34 miles, was opened for traffic Oct. 29.

Schuylkill & Lehigh Valley.—The Lehigh Valley has secured a 999-year lease of this road now building from Bowman's Station to Tremont, a town west of Pottsville, in the Schuylkill region. This gives the Lehigh Valley a competing connection with the Philadelphia & Reading and Pennsylvania roads in this district.

Seneca Falls & Waterloo.—This short New York road was sold last week at Waterloo to satisfy a mortgage of \$80,000 held by the Metropolitan Trust Co., of New York. It is stated that the purchaser will change the motive power of the road, operating it as an electric line.

Sonora, Sinaloa & Chihuahua.—The Rosenfield Construction Co., of Denver, which has the contract for tracklaying on the 34 miles of the Deming, Sierra Madre & Pacific, from Deming, N. M., south to the Mexican line, will begin work immediately, the grading being completed. Active work on the line in Mexico is dependent on the placing of Mexican Government bonds. It is reported that these bonds will soon be sold. The company has a concession from the Mexican Government granting \$13,000 per mile subsidy, and 2,500,000 acres of land, with additional rights in regard to mineral lands, timber, etc. The subsidy is paid on the completion and reception by the government representative of each 6½ miles of road. The contracts have been let for 220 miles east from Guaymas, Mex., and 150 miles south from Deming. Elliot & Hass, Deming, N. M., and Room 15, Lake Side Building, Chicago, Ill., are the principal contractors. Profiles have been made for but a comparatively small part of the line. In addition to the 34 miles graded at Deming, about 30 miles are also graded at Guaymas, east, and six at Chihuahua, west. The line is to extend from Deming, via Palamas, Guerrero (or Concepcion) and Chihuahua; thence west to Guaymas, and south to Topolobampo Bay. The line will be about 1,500 miles long. Bridges and tunnels will be frequent about the middle portion of the road, where no profile has yet been made. The road is being built by a construction company composed of G. H. Sisson, Stephen G. Caldwell, and others, with office at Phenix Building, Chicago.

South Carolina.—John S. Barnes and Samuel Sloan, of New York, trustees of the first-mortgage bonds of the company, filed a complaint in the United States Court at Charleston, S. C., Nov. 1, asking that a receiver be appointed in their behalf, pending proceedings by which the payment of the principal and interest on these bonds might be ordered. The road is now in the hands of ex-Gov. Chamberlain as temporary receiver upon the complaint of the holders of the second-mortgage bonds.

Southern Pacific.—The line across Sutter County from Knight's Landing to Yuba City, 27 miles, has now been completed, with the exception of about two miles, and it will probably soon be opened for traffic. A large drawbridge has been built over the Sacramento River at Knight's Landing. There is over three miles of trestling above the bridge.

It is expected to open the San Joaquin Division from Newman to Los Banos, 21 miles from Newman, this week. The line follows the west side of the San Joaquin River from Tracy, and is now completed to a point 48 miles south of that place.

Staunton & West Augusta.—The Staunton & West Augusta has been consolidated with the Atlantic & Ohio and the contract for the construction and equipment of the road has been let to the New York Mining & Construction Co., 52 Wall street, New York. The road is to be about 250 miles long.

Tacoma & Puyallup.—This company was incorporated at Tacoma, Wash., last week, with a capital stock placed at \$100,000. The object is to construct a road connecting the two cities. The incorporators and trustees for the first six months are: R. F. Radebaugh, Frank O. Meeker and C. W. McAllister.

Temiscouata.—Ground was broken for the St. Francis extension on this road last week. The branch is to extend from a point on the main line near Edmundston, N. B., up the St. John River, a distance of 20 miles, to the St. Francis River. Ten miles of the line is now under contract to Malcolm and Ross, of Edmundston.

The party of surveyors who are running the proposed extension from Edmundston to Moncton is making considerable progress, and it is expected to have the survey completed by Dec. 1.

Texas Cattle Trail.—This company was organized last week in Albany, Tex., with a capital stock of \$500,000. The route is as follows: Beginning at Vernon, in Wilbarger County, through Knox, Baylor, Haskell, Throckmorton, Jones, Shackelford, Taylor, Callahan, Runnels and Coleman to Brady, in McCullough County.

Tilton & Franklin.—Two routes have been surveyed for this road which is proposed to build from Tilton to Franklin, N. H., about five miles. The road will connect the Concord & Montreal with the Northern, leased by the Boston & Maine. The company has a capital stock of \$200,000, and it is estimated that the road will cost this amount to build.

Toledo, Ann Arbor & North Michigan.—The company has commenced operating the line from Harriette through Sherman and Weldon to Manistee Junction, Mich., 111 miles.

Topeka, Westmoreland & Maryville.—This company, which proposes to build a line from Topeka north to the Nebraska line, has submitted a proposition to the City Council that if the city of Topeka will vote aid in the amount of \$30,000 the company will erect its machine and repair shops there. Bonds have already been voted in Pottawatomie and Marshall counties.

Troy & New England.—This company has been organized in New York to build a line from Troy to Averill Park, N. Y.

Union Pacific.—The government directors of the road have reported to the Secretary of the Interior that in their judgment the interests of the United States demand early action by Congress to secure the payment by the company of its indebtedness to the government. The general plan of settlement first suggested by the Commissioner of Railroads, they assert, has never been successfully attacked. The government directors fully approve of this plan and also concur in the recommendations made in the last report of their predecessors.

Wilmington & Weldon.—The surveys for the proposed extension of the Scotland Neck Branch from Greenville south to Kingston on the Atlanta & North Carolina road, a distance of 28 miles, have been completed, and the work is now ready to be put under contract, which will probably soon be done. Work on the extension will be light, the maximum grade being 30 ft. per mile and the maximum curves three degrees. There will be two drawbridges with one span each. F. Gardner, of Wilmington, N. C., is Engineer of Construction.

TRAFFIC.

Traffic Notes.

The Duluth, South Shore & Atlantic has reduced lumber rates from Duluth to the Atlantic seaboard to 35 cents and 33 cents to Boston and New York, respectively. This is 15 cents lower than by way of Chicago, and only five cents higher than from Chicago to New York and Boston.

A Cincinnati dispatch states that about 1,000 residents of Lockwood, Elmwood, Winton Place and Carthage (suburbs of that city), who have for years been patronizing the "Bee Line," marched in a body to the Cincinnati, Hamilton & Dayton, Nov. 1, and purchased tickets over that road for November.

The Iowa Railroad Commissioners have decided the Davenport jobbers' case, holding that through billing must be restored, the same as prior to the withdrawal of joint rates, and that the board cannot make a class "A" rate on part of the business of the Burlington, Cedar Rapids & Northern, and not for all, and hence declines to make such rate.

The joint committee of the Trunk Line and Central Traffic associations has issued notice directing an advance in iron rates to regular fourth and fifth classes, taking effect Nov. 18, or 30 cents per 100 lbs. from Chicago to New York, c. l., and 35 cents l. c. l. The present rates are 25 and 30 cents respectively. This advance has been ordered in view of the rise in the prices of iron.

The Pennsylvania has made a round trip rate to the Catholic Congress in Baltimore much lower than the figures heretofore customary in the Central Traffic, Trunk Line and other associations. The rate is a single fare for the round trip, and the reduction amounts to \$5.35 on tickets from Chicago, and makes the rate \$17.50 instead of \$23.35. Tickets are good from Nov. 7 to 12, inclusive. The Baltimore & Ohio at once met the rate.

Judge Cooley on Ticket Commissions and "Scalping." The following letter from Chairman T. M. Cooley, of the Inter-state Commerce Commission, to Chairman John N. Abbott, of the Western States Passenger Association, has been published:

"Object-lessons are apt to be most impressive teaching, and what is taught thereby is most certain to be remembered and acted upon. I desire to call your attention, and through you the attention of your associates, to the question whether the railroads of the country, and especially of the interior, are not now giving the public an object-lesson which is certain to impress the public mind that regular passenger rates are now altogether too high.

"In imposing such rates it is, of course, assumed that the rates are prescribed as a reasonable compensation for the service actually performed for those who are to pay them. But has not the public abundant reason for believing that considerable numbers of persons are all the while being improperly carried free, the cost of their carriage being necessarily to keep up the usual rates charged to those who pay?

"This, however, is not the part of the lesson to which I wish most particularly to direct attention now. The extraordinary manner in which the privilege to give excursion rates is abused is a much greater wrong to those who pay the customary rates than is even the improper free transportation. That privilege might be exercised, as the law contemplated, without wronging any one, because it would tend to create a basis for special occasions that would not otherwise exist, and the cost of which would be more than met by the returns. But that it is improperly exercised when the excursion rates only tend to cut the regular rates is unquestioned. Moreover, you cannot fail to know that excursion tickets in

great quantities are issued with an understanding, express or implied, that the condition of issue shall not be enforced, and that they, or at least the return portion thereof, may be used instead of the regular tickets; the consequence being that upon the same trains there are passengers at all times to be found, some of whom have paid for their passage twice, or more than twice, as much as others, though neither in law nor in morals is there reason for any difference.

"The public see that incident to this method the carriers furnishing support on the apportionment for large profits to a considerable number of persons in all sections of the country in a business that ought not to exist at all—the business known as that of ticket broker, or 'scalper.' Sometimes these persons are made use of directly, as a means of cutting rates—more often indirectly, when thereby the same end is accomplished. But whether used directly or indirectly, the effect on the traveling public is the same; the cost of supporting them and their business falls upon the public; their profits tend to keep rates excessive.

"In view of these facts, the following questions naturally arise:

"1. When the railroad companies thus so distinctly give the public to understand that their regular rates are more than a fair remuneration for the services performed for those who pay them, why should not the fact be stated with equal distinctness by the Commission in its official communications?

"2. If persons charged the regular rates should complain of them as excessive, and bring out the facts above stated as proof, how could the railroad companies undertake to show that complaint to be not well taken?"

Car Detention Charges.

The preliminary steps have been taken to organize car service associations at Dayton, Mansfield, Gallon and Akron, Ohio. The St. Louis association has commenced operations, with headquarters in the Fagin building. The Northern Pacific, St. Paul & Duluth, Chicago, St. Paul, Minneapolis & Omaha and Eastern Minnesota will have an association at Duluth, Superior and West Superior. The Pennsylvania, which has been collecting detention charges more or less for a year or more, has issued a notice at Pittsburgh which indicates that it intends to put the Time Convention rules in force generally. The New York, Lake Erie & Western has issued a notice, taking effect Nov. 7, which seems to apply to the whole road. At Cleveland it is proposed to allow the coal dealers 96 hours in which to unload cars.

Closing Lake Navigation.

The Great Northern Steamship line has given notice that after Nov. 5 it will refuse to receive shipments to New England points, and after Nov. 9 it will refuse them to New York.

Texas Cattle.

The Secretary of Agriculture has issued the following order in regard to the transportation of Texas and Southern cattle, to take effect Nov. 1:

"The order of July 3, 1889, prescribing regulations for the transportation of Texas and Southern cattle and for the isolation, cleaning and disinfection of pens which had been occupied by such cattle, is hereby revoked. It is believed that the danger from splenic or Texas fever has passed for the present year."

Northwestern Rates.

At a meeting in Chicago, Nov. 4, it was decided to restore Northwestern rates to the old basis Nov. 20. This result was brought about by the acceptance of the proposition made in the New York conference of the Canadian "Soo" and Trunk lines. It advances through rates about 75 per cent, and local rates 3½ per cent. The commodity tariff is also abrogated. The previous meeting failed to agree upon an advance because the Chicago, Milwaukee & St. Paul had issued a large quantity of milling-in-transit orders for shipments of flour at 7½ cents from Minneapolis to Chicago. The through rates agreed upon from New York and Boston to St. Paul and Minneapolis, via all lines, are as follows: \$1.15, \$1.80, 56, 48 and 40 cents. The local rates, Chicago to St. Paul, Minneapolis and Minnesota transfer, are as follows: 60, 50, 40, 25 and 20 cents.

Steps were also taken to restore rates to Mississippi River points, which had been lowered as far as Burlington, in sympathy with the low St. Paul rates. Also, it was decided to restore rates in Wisconsin, and between all other points where rates had been reduced by reason of the 40-cent scale between Chicago & St. Paul.

Switching Questions in Iowa.

The Iowa Railroad Commission having ordered the Chicago, Milwaukee & St. Paul to switch at Dubuque cars of oil arriving from the East over the Chicago, St. Paul & Kansas City, and destined to Fenger's lime-kiln at Eagle Point, the former road has established a prepaid station at Eagle Point, and is ready to receive all freight for that station on receipt of the charges fixed by the commission for a distance of five miles. The commission has fixed no rates for a shorter distance, and the five-mile rate will be demanded, although Eagle Point is only three miles from Dubuque.

East-bound Shipments.

The shipments of East-bound freight from Chicago by all lines for the week ending Saturday, Nov. 2, amounted to 68,940 tons, against 70,166 tons during the preceding week, a decrease of 1,226 tons, and against 54,924 tons during the corresponding week of 1888, an increase of 14,016 tons. This includes flour, grain, seeds, provisions, dressed beef, hides, wool and lumber. The proportions carried by each road were:

	Wk to Nov. 2.		Wk to Oct. 26.	
	Tons.	P. c.	Tons.	P. c.
Michigan Central.....	8,405	12.2	7,787	11.1
Wabash.....	5,149	7.5	4,586	6.6
Lake Shore & Michigan South.....	12,379	17.8	14,647	20.9
Pitts., Ft. Wayne & Chicago.....	7,800	11.3	7,508	10.7
Chicago, St. Louis & Pitts.....	9,801	14.2	8,703	12.4
Baltimore & Ohio.....	6,513	9.5	7,611	10.9
Chicago & Grand Trunk.....	7,224	10.5	7,185	10.3
New York, Chic. & St. Louis.....	3,781	5.4	3,839	5.5
Chicago & Atlantic.....	7,997	11.6	8,300	11.6
Total.....	68,940	100.0	70,166	100.0

Of the above shipments 3,051 tons were flour, 30,370 tons grain, 2,492 tons millstuffs, 4,681 tons cured meats, 2,190 tons lard, 9,201 tons dressed beef, 1,113 tons butter, 2,230 tons hides, 283 tons wool and 6,662 tons lumber. The three Vanderbilt lines together carried 35.4 per cent., while the two Pennsylvania lines carried 25.6 per cent.